MARINE RECORD

ESTABLISHED 1878.

VOL. XXII, No. 31. CLEVELAND---AUGUST 3, 1899---CHICAGO. $2.00 Per Year. 5c. Single Copy.

LAKE CARRIERS' ASSOCIATION.

To consider and take action upon all genera questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interests of Lake Carriers, and improve the character of the service rendered to the public.

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EXECUTIVE COMMITTEE, LAKE CARRIERS, ASSOCIATION.

A meeting of the Executive Committee of the Lake Carriers' Association was held in the offices of Capt. James Corrigan, on Tuesday.

A communication from Mr. Barter, of the Longshoremen's Union, asking for an increase of pay in discharging iron ore from untrimmed vessels, was met by the ore dock managers submitting the following proposition which will, no doubt, be acceptable to the men.

"There shall be no discrimination in the unloading price against any particular grade of ore because of its physical structure, whether soft ore, crushed or uncrushed hard ore, or bulky silicious ore, but where boats with untrimmed cargoes are offered for unloading and all or parts of cargoes are in bad shape, there shall be extra pay at a rate not to exceed 2½ cents per ton for the ore in hatches pronounced to be in bad condition.

The hatches for which such extra compensation shall be granted shall be determined by a standing dock committee, to consist of the superintendent or foreman in charge of the dock at which the vessel may arrive, and a representative of the shoveling gangs to be appointed by them, and in case an agreement cannot be reached a third, disinterested party, shall be chosen by the two and his decision shall be final. The tonnage upon which the extra compensation shall be allowed, shall be the tonnage loaded in these hatches pronounced to be in bad condition, as shown by the loading records of the vessels. In case of disagreement upon the condition of any particular cargo, there shall be no suspension of work on any vessel besides the one in dispute, and all other work at the dock shall continne unterruptedly while the disputed case is being arbitrated."

A letter from Mr. George B. Uhler, National president of the Marine Engineers' Beneficial Association, addressed to Charles H. Keep, Esq., Buffalo, Secretary of the Lake Carriers' Association, was presented to the committee. The letter contained a request for an advance of 12½ per cent. over the present schedule of wages paid to lake engineers and to take effect August 1st. The matter was taken up at the meeting in connection with a new schedule of wages for the fall months. At the opening of the season the wages were advanced over those of last year. The engineers and first mates received a greater advance than the other men, and the members of the committee were in favor of making no change in their wages. The owners present said that they had heard no complaints and that their engineers have not asked for an advance. Messrs. H. A. Hawgood, J. W. Moore, George P. McKay, and A. R. Rumsey were appointed a committee to fix a schedule of wages from second mates down in the list. An advance if decided upon not to exceed 10 per cent. The committee will report Aug. 15, and if a new schedule of wages is adopted it will probably go into effect Sept 1.

LAKE LEVELS—THE CHICAGO DRAINAGE CANAL

Unless the plans of the sanitary district are thwarted, the big Chicago drainage ditch will be thrown open in about three months and Lake Michigan will be called upon to give up at least 5,000 cubic feet of water every second, or 300,000 cubic feet a minute. What result this will have on the lake level is speculative, but hydraulic calculations and scientific investigations at other exhaust points of the chain of lakes leave no doubt as to the effect. The anomaly may be presented of a rising lake level, with the drainage canal taking 300,000 cubic feet of water from Lake Michigan every minute.

Civil Engineer, Lyman E. Cooley, who was the first to investigate the problem involved in the scheme of sanitation and who has made an exhaustive study of the subject of lake levels, explains the principle in hydraulics which serves as a basis for the present estimates of the effect on the lake level when the sanitary canal is opened.

"Only those not conversant with the conditions which produce a fall or rise in lake levels are in doubt as to the effect of the opening of the drainage canal," said Lyman E. Cooley. "There is at present every assurance, based upon precipitation, barometric conditions and the flow at the other outlets, that the water level of Lake Michigan will be steadily rising with 300,000 cubic feet of water passing through the drainage canal every minute. At the present time we reach our deductions on what I might call an academic basis, or from principles governing applied hydraulics. In other words, we observe the annual changes in lake levels produced by changes in precipitation, the exhaust from the watersheds of the Great Lakes, the wind and barometric conditions.

"We have learned what the flow of water is per minute through the St. Clair and Niagara rivers at various times.

By way of simplifying the propositions we must regard the chain of lakes as one great body of water and Lake Michigan a name used only for geographical distinction. Investigations are going on under the direction of the United States Engineering Corps to determine the discharge through St. Clair river at Detroit, Niagara river and other points. In the investigations so far made the mean discharge of the St. Clair river was found to be 225,000 cubic feet a second, and the discharge at the Niagara river 265,000 cubic feet a second.

"Now, the law creating the sanitary district of Chicago requires that the ultimate flow into the drainage canal shall be 600,000 cubic feet per minute. The plans of the sanitary district anticipate such an ultimate flow. But for present purposes there will be 300,000 cubic feet of water flowing through the canal a minute. The law requires that for every increase of 100,000 inhabitants within the district there shall be provided an additional flow of 30,000 cubic feet a minute in excess of the 300,000 cubic feet based upon a population of 1,500,000. The maximum of water cannot be sent through without extensive improvements by the general government to receive that amount of water in the Illinois and Michigan canal.

"For the purpose of considering the extremists' views we shall calculate the maximum amount of water of 600,000 cubic feet a minute is sent through the canal. The lakes, like streams, are subject to constant changes in levels. They rise and fall according to seasons, waterfalls, droughts, and snowfalls and precipitation. The range of these fluctuations is much greater on lakes because of the great water surfaces, allowing a greater effect from evaporation, wind, etc. Whatever effects the water supply of one lake affects also in a degree the supply of others. Calculating, therefore, upon the basis of a discharge of 225,000 cubic feet of water a second through the St. Clair river and 265,000 cubic feet through the Niagara river, the flow of 10,000 cubic of water a second or 600,000 cubic feet a minute through the Chicago drainage canal would produce the effect of diminishing the flow through the St. Clair river 4½ per cent and through the Niagara river 3¾ per cent. In other words, the lake level is reduced between two and four inches.

"The effect this decrease may have upon lake navigation or lake levels is insignificant; it is understood that the mean annual fluctuations between the high water of late spring and early summer and the low water of late autumn and winter for Lake Michigan amounts to 1.34, and varies in the other lakes over one to two feet.

"The outflow of water lowering the level technically three or four or six inches would not be noticed by the navigator. When it is understood that the Detroit river has been deepened from 13 to 21 feet, the St. Clair flats from 9½ to 16 feet and St. Mary's river from 9½ to 16 feet, and that the Niagara has been cut down to 21 feet, the insignificance of taking 300,000 or twice that number of cubic feet of water a minute is readily appreciated. All these changes in outlet conditions necessarily affected lake levels.

NEW YORK CANALS.

The New York State canal system during the current season shows a marked increase in the total tonnage carried as compared with the statistics of the same period of 1898. The increase presages the season to be one of the most successful in the State waterway traffic in a long period of years. If the increase in traffic continues until the close of navigation the total amount will have reached about 4,000,000 tons, which figure has not been attained since 1892 and 1893, when the general prosperity attending the World's Fair period was prevalent.

The canal system has been in operation about three months, and during that period 1,406,811 tons have been carried in comparison with 1,107,617 during the same period of 1898, an increase of 298,194 tons. If this increase continues for the remaining four months of navigation its total will be about 600,000 tons. The total tonnage of the canals for 1898 was 3,360,063 and with an increase of 600,000 tons would make the total amount this year in the neighborhood of 4,000,000 tons.

The canals opened on April 22 this year and on May 8 in 1898, so that there are actually two weeks more of navigation this year than last. From April 22 to May 1 this year 63,113 tons were carried and from May 1 to May 8 about the same number of tons, but even with these advantages of the present season over that of 1898 there is an increase of over 170,000 tons.

The increased traffic is due in the main to the betterment of the business conditions which has resulted in larger shipments from the West. A disagreement among some of the grain elevator operators at Buffalo and the exclusion of several from the pool is said to be another condition having an influence on the increase. The betterment has not in any way been the result of the canal improvement work. That can exert no influence until it is completed.

Seamen's Wages—Rights of Assignees.—The assignee of a seaman's claim for wages has no lien. The Clara A. McIntyre, 94 Fed. Rep. (U. S.) 552.

BUFFALO.

Special Correspondence to The Marine Record.

Capt. H. Miller, of the Anchor line steamer Schuylkill, says that he logged 14¼ miles from Fort Gratiot to the wreck of the schooner John Breden, 15¼ miles from the wreck to Sanilac, course N. ¾ W. from lightship to 1¾ of a mile westward of wreck, which is lying N.E. and S.W. with top masts about 25 feet out of the water. If Capt. Miller wanted to show the speed of the Schuylkill, 15¼ miles an hour is good steaming. He does not say whether the miles are statute or nautical, the course compass, magnetic or true, but he does tell us that the masts are in line and that they show well above the water, say, about, 25 feet.

We have had a State committee here this week taking evidence regarding the trade, etc., through the Erie canals. Secretary C. Hallam Keep, of the Merchant's Exchange, the well-known statistician on lake commerce, and also secretary of the Lake Carriers' Association, was indefatigable in his efforts to bring all possible evidence before the committee, of which General F. V. Greene was chairman. Much good is expected from the work of the special committee on New York canals, and outside of the present canal boat owners it would seem as if the concensus of opinions leaned towards a canal large enough to permit 1,500 to 2,000-ton boats being used.

The large twin-screw, exclusively passenger steamers North West and North Land, of the Northern line, are increasing their business as lively as it is possible each season. A passenger list of 300 was the record for the North Land this week and the heaviest portion of the summer travel is just now coming on. As advertisers for the Great Northern Railway the big twin-screw sister ships "take the cake." Their cost was steep and it takes a few doubloons each day to keep them running and this, too, barring all accidents, but Mr. J. J. Hill, president of the railroad company, knew full well what he was about when these two vessels were put on the route between this port and the head of the lakes.

Upwards of two weeks have elapsed since tidings were received from the steamer Harlem stranded last fall on Isle Royale, Lake Superior. A passing vessel then reported that steam pumps had been put in operation with the expectation that the wreck would be floated in a very short time. It is evident now the wreckers met with disappointment regarding the condition of the stranded steamer. While her side presented a favorable appearance to them, the bottom of the craft was no doubt found in such bad shape that a vast amount of patching must be done by divers before the pumps will be able to make any impression on the leakage. It may require a couple of weeks yet to float the craft, and she may not float at all, but there seems no good reason why she should'nt, even if the bottom is half punched out of her.

Coal men report that there is a shortage of about 200,000 tons in bituminous coal at the head of the lakes. It is believed that there is a slight shortage of anthracite, but it is not important. Two causes have contributed to the shortage of soft coal. One has been strikes in the mining regions and the other has been high lake freight rates. The present rates are 40 and 60 cents, as compared with 20 to 25 cents a year ago. Coal rates are exactly double what they were last season. The shippers have naturally been reluctant to accept the advancing rates during the upward movement and this has retarded shipments. It is believed that coal freights will rule higher than now before the end of the season. There is a demand at the head of the lakes for about 3,000,000 tons this year. Coal shippers will have to bestir themselves from this on if they have contracts to fill, contract tonnage will be kept busy as late as possible and there are but few vessels free to charter.

Coal is being shipped from here as lively as possible. Buffalo has led the freight rates and secured tonnage when Ohio shippers were grumpy and would not pay a fair rate, expecting that this season would turn out like all previous ones. Buffalo shippers knew better; they caught onto the signs of the times, also to every charter they could capture, with the result that nearly a million tons of coal has been sent forward so far. This is a greater amount than has been shipped since 1894, when about 80,000 tons more had been shipped up to August 1. A record has also been gained in the receipts of iron ore, as nearly half a million tons has been discharged here, and lots more to come. Buffalo's shipping interests by no means depends on the Erie canal trade; it is, of course, an assistance, but now merely as a side issue to the prosperity of the port and adjacent territory. The far west and eastern New York wants the ditch, if anything, more than we do.

THE George B. Owen has been repaired and will be a consort of the steamer Bermuda in the Duluth and Lake Erie lumber trade.

DETROIT.

Special Correspondence to The Marine Record.

Dredging has been done so as to give 19 feet of water at Sandusky harbor.

The river ferryboat Garland is having her shaft repaired at the yards of the Detroit Ship Building Co.

Mr. F. W. Wheeler has invested in an immense timber land purchase in Michigan. The deal involves nearly half a million dollars but others are interested with Mr. Wheeler.

Roy Hardy, said to be the son of a Detroit contractor, fell off the deck of the steamer Mohawk, at Duluth, and was drowned. The life-saving crew recovered his body after an hour's search.

The fine powerful wrecking tug Favorite, Capt. Mart Swain, has been dispatched from Cheboygan to Sleeping Bear Point, to release the Toltec and her consort Miztec, ashore there, lumber laden.

The tug Robt. Boyd, Capt. DeLand, is now stationed at East Tawas, and will be kept there for the balance of the season, to do harbor towing, etc. The Boyd is a good tug, and vessels frequenting the port will meet with every attention and facility.

In the way of steam vessel inspections, Grand Haven leads all Michigan cities. Her inspectors examined enough steamers to get them $2,000 for the coming year. Detroit and Port Huron officials are tied in the $1,800 class and Superior men will make $1,500.

Capt. H. J. Slyfield of the D. & C. steamer City of Mackinac considers the wrecked schooner John Breden a dangerous obstruction to vessels entering or leaving Port Huron. The spars of the schooner project above the water and no lights are displayed at night.

Two tugs have been wiped off the list this week. The tug Grace A. Ruelle, of this port, foundered in Saginaw Bay on Saturday night, with the loss of her master, Capt. Lemay, who was very well known. The other one was the tug Pilot, burned and sunk in Green Bay, without loss of life.

Four steam pumps have been ordered from Port Huron to assist in freeing the Harlem, steam has been raised in her own boilers, and with as much more pumping capacity as she now has it is thought that she will be floated at the first attempt, although her bottom is in very bad shape.

Thomas O'Neill, a Detroit marine engineer, has passed away at Toledo with consumption. His death was very sudden, as he had been about on his feet ten minutes before expiring. When taken sick four months ago he was engineer on the steamer Blanchard. He was thirty-eight years of age.

The Cumberland and Aurania, while passing the B. L. Pennington, in tow of the Spencer, collided in Lake St. Clair. A steam pump was put on board the tow barge by Parker & Millen, and she proceeded on to Tonawanda, suction was to blame, or is blamed, for this triangular conflict in narrow waters.

It is now said that the light-house tender Amaranth could have made a lee for the tug Ruelle, or at least seen the little craft out of danger before she ran for shelter herself. The Amaranth is a good sized boat compared to the lost tug. It is not the tug so much as the loss of Capt. Lemay that vessel men speak about.

Capt. A. J. McKay, master of the steamer City of Detroit, reported that the steamer Shenandoah, which went ashore on Grubb's reef, west of the dummy, Sunday night, was still hard on. Her coal cargo is being lightered. Capt. James Davidson is at the stranded vessel, and with fine weather she is likely to be floated in short order.

The fine large coal docks, which were built by the Pennsylvania & Ohio Fuel Co. last year, at Manitowoc, have been leased to the C. Reiss Coal Co., of Sheboygan. Coal will be rushed to these docks until the close of navigation, and the new management will try to bring up their capacity which is 150,000 tons. The docks are located on the lake front, and were only in operation a year, when the company went into the hands of receivers. The docks were recently turned over to the Chicago & Northwestern Railroad Co.

Assistant Secretary Spaulding of the Treasury Department has remitted a fine of $500 assessed against the wrecker Favorite, owned by Parker and Millen, of Detroit. The record in the case shows that the owners were fined for permitting the vessel to run beyond the expiration of her papers, but it was shown that she had been engaged in releasing the steamers Majestic and Oglebay during the time overrun. No other explanation was then necessary. The wrecker Favorite is too good a boat to let go a job simply for the sake of having her annual papers re-indorsed. She is always kept away above inspection requirements, etc.

The steamer Oceanica, of the Lehigh Valley Transportation Co., and the steamer Wlliam Chisholm, of Cleveland, collided on the night of August 14, 1896, near Windmill Point, at the head of the Detroit river. The owners of the Oceanica libeled the Chisholm, and the latter owners cross-libeled the Oceanica. The case was tried in the United States District Court here, before Judge Swan, some time ago. His Honor has dismissed the libel with costs, and directed a decree for the cross-libellants, holding the Oceanica solely in fault, and ordering full damages against her, the same to be ascertained by Commissioner D. J. Davidson.

Col. G. J. Lydecker, Corps of Engineers, U. S. A., stationed at this port recommends an enlargement of the St. Clair Flats Canal. He says in his annual report to the chief engineer, Corps of Engineers, U. S. A., Washington, that "The amount of commerce passing through the canal is snbstantially the same as through the Detroit river, and this was about 40,000,000 freight tons last year. The available width of the deep water channel between the dykes of the present canal is only 300 and this is altogether too little for the safety and convenience of the commerce now passing through it. There is no doubt that this width should be doubled, or else that a second cut be made adjoining the present one, providing separate channels for ships moving in opposite directions. This matter is of such importance that I feel justified in taking the exceptional course of suggesting that it be brought to the attention of Congress with a recommendation that action be taken. The present canal cost, as it stands today, $761,750.

Civil Engineer George Y. Wisner, of this city, who is a member of the United States Deep Waterways Commission, states that he is absolutely certain that it was possible to maintain a level depth of water in Lake Erie throughout the entire navigation season by installing a dam at the foot of the lake. This dam, Mr. Wisner declares would cost less than $3,000,000. Mr. Wisner also stated that the dam would raise the level of the lake three feet. The problem of lake levels has been worked upon by Mr. Wisner for some time, and he says he has proved mathematically that his statements are true. No one can doubt Mr. Wisner's statement, as with locks at each outlet, any desired level can be maintained. I notice that the RECORD mentioned, some few issues ago, that lock gates would be placed in the rivers St. Clair and Detroit, as well as the "Soo," also at other connecting links in the chain of lakes, but the assumption was qualified by dating this innovation ahead to some time in the dim and distant future. Everyone can have a guess coming some time.

Capt. J. W. Westcott has joined forces with the citizens of St. Louis towards preventing the opening of the Chicago drainage canal. Capt. Westcott, who is in earnest when he is aroused, as in this case, says that "the vessel-men should get up in arms against this outrage. It has cost," he adds, "on an average of $2,000,000 an inch to raise the level of the lakes and in the waterways." The captain thinks the Chicago canal will "if opened, lower the water not only in Lake Michigan, but right here in Detroit and everywhere else this side of Niagara Falls;" that the "canal will divert the stream of the St. Mary river so that it will flow in the direction of the canal, and keep on going there." In an editorial on this subject the Detroit Journal considers there is no cause for alarm. "The canal will be opened on permission already given by the Secretary of War and in the face of stronger protests than can be brought to bear at this late day. These protests have had all the effect that the marine interests of the lakes could desire, short of actually forbidding that water shall be turned into the canal from Lake Michigan; and the moment that it is shown by the engineers that the level of the lakes is to be seriously lowered by the canal, it will be closed. In other words, a practical test is to be made, and if the result of that test is against the canal, it will go dry, so far as Lake Michigan is concerned, the permission of the Secretary of Way that the water could be turned on, being conditional and tentative." The main question however, lies in the fact of being able to distinguish the immediate effects and ultimate results of this drain. The whole question of precipitation must be fully dealt with first, this is still an unknown quantity, so also is the evaporation process. An inch or two of shoaling is thought nothing, but it often makes the difference of a vessel being neaped, grounded or waterborne. The Chicago, as well as other great drains from the basin of the lakes, will stand the most active work and searching inquiry, unless we want to court an eventual disaster.

CHICAGO.

Special Correspondence to The Marine Record.

The port of Waukegan now wants a deputy collector of customs to note its increasing lake commerce.

The schooner Robert Howlett, now lying at South Chicago, is to be sold by the United States marshal in a few days.

The Genessee, of the Rochester Yacht Club, will be our champion for the Canada cup, to be sailed at Toronto August 21.

The propeller Gordon Campbell has been purchased from the Anchor line, Buffalo, by Capt. Miles Barry, of Chicago, for $15,000.

The Spaulding Lumber Co.'s tug Pilot, burned and sank in Green Bay on Saturday night. The crew landed on their yawl boat about fifteen miles from Menominee.

A slip 1,100 feet long and 200 feet wide, with accommodations for four vessels, will be built at South Chicago, by the Illinois Steel Co. The old slip, just inside the harbor, is to be filled in and used for stock piles.

"Steel and Portland Cement" is the title of a neat pamphlet of the Illinois Steel Co. The company manufactures cement from blast furnace slag. The present output of 1,000 bushels of cement a day is to be increased.

Underwriters are shaking hands with themselves these times on account of the season being so free from losses. Captains are said to have grown more cautious. If cautiousness is the keynote, a properly cautious master who is known to be such, ought to strike for a raise of pay.

Capt. James Travis takes charge of the steamer Jesse Spaulding, launched at West Bay City last Saturday. Her principal dimensions are 238 feet over all, 220 feet keel, 40 feet beam and 16 feet deep. She is equipped with triple expansion engines, 17, 28 and 47 inch cylinders by 36-inch stroke.

As showing the good demand for boats in the lumber trade the steamer F. E. Spinner, which has been out of service for three years, re-appeared in Chicago this week with a lumber cargo, and will be regularly in the trade for the remainder of the season. The Spinner is owned by E. J. Ransom of Sault Ste. Marie.

Chicago marine news can not escape for a single week without it being recorded that a schooner had poked her jib-boom into a bridge, sometimes to the injury of both structures, but more often to the schooner's. This item has long been a chestnut. This week it was the schooner A. T. Bliss that had a rastle with the Twelfth street bridge, and as usual the bridge came off best.

The sale of the steamer Frank Woods is reported. She is owned by Capt. Ralph C. Brittain of Saugatuck, and is run between Grand Haven, Sheboygan and Manitowoc. The price paid was said to be $14,000. The steamer was purchased in the interest of Galveston people, and she will be taken to the Gulf of Mexico by way of the River St. Lawrence. For three years the Woods ran in the Graham & Morton line.

Chicago grain shippers are planning to build a large elevator on the Calumet this season. The ground has been looked over, and only the purchase of the land prevents the location and the owners from being announced. The plans take in the formation of a new slip, a winding basin and other improvements, which indicate that the elevator is to be built some distance up the river. This is an indication of how the trade is leaving the creek here, or soon will.

The lumber shovers are reconsidering their famous tariff, which caused so much discussiou among vessel men and shippers a short time ago. It is said that the leaders among the men have seen the unjust side to the card of rates, which makes lumber carrying to Chicago almost impossible for large boats, owing to the heavy tax levied on the cargo by the men. The new scale will provide an additional rate on all lumber in a cargo over 400,000 feet, but not for the first 400,000 feet. This meets with the hearty approval of vessel men.

Contracts were let on Satnrday for the erection of a new grain elevator for Bartlett, Frazier & Co., on slip 2, immediately east of their other elevators, at One Hundred and Second street, South Chicago. The Hausler & Lutz Towing Co., which has the contract for the putting in of the foundations, asserts that it will gain on all records for rapid work, by putting on three machines and driving from 150 to 200 piles each day. The elevator will have a capacity of 1,750,000 bushels of grain, and will be built by Barnet & Record, of Minneapolis. The contracts call for the completion of the elevator within 120 days.

The fifth serious accident occurred Tuesday in the removal of the wreck of the City of Duluth at the mouth of St. Joseph harbor, under the contract of Capt. Jex. Robert McGee, an expert diver, while standing upon the main deck of the wrecking schooner Judd, was struck in the back with the end of a plank, which gave away while under the heavy strain of a lifting jack. Although Capt. Jex has been engaged in the wrecking business for twenty years, never in his entire career has he experienced such ill luck as since taking this contract a year ago. It is said Jex is now financially ruined, having lost $2,000 to date upon the job, while the machinery of the wrecked craft is still unmoved.

A movement is on foot here to establish a home, or retreat, for aged and incapacitated seamen. Admiral Dewey has been asked to become a patron so that his name can be used in connection with the organization of such an institution. It is figured that there are 20,000 seamen on the lakes, and a home for the aged is needed. A fund could be raised by assessing each member a certain sum per month. While the movement is only in its initial stage, it is said that there is no doubt of its final adoption. The gentlemen interested in the project are Mr. Luther Laflin Mills, General John McNulta, Lieut B. W. Wells, U. S. N., and Lieut. W. J. Wilson, U. S. N. Every man earning his living on the lakes will no doubt wish these noble philanthropists a full measure of success in their important undertaking.

ESCANABA.

Special Correspondence to The Marine Record.

The new light at Long Tail Point, entrance to Fox river is about ready for use.

The big Minnesota Co.'s barge Manila gained all carrying records in the ore line out of this port last week.

Every incoming passenger boat is filled up with tourists, and captains report business the best in many seasons.

Giving up trimming no doubt caused the R. E. Packer to be docked at Cleveland last week to have a leak stopped.

The steamer Tecumseh is at Green Bay taking in the last cargo of hardwood timber consigned to Europe. It will take about 200, 60-foot sticks to make up a load.

Capt. Mathewson, of Peshtigo, Wis., in charge of the car ferry barge No. 2, fell overboard from that craft Saturday in the river and was drowned before assistance could be rendered.

Just after entering Green Bay bound to Escanaba Saturday the I. O. T. steamer Manchester broke a crank pin on the air pump and was picked up by the steamer Ferd. Schlesinger.

The hardwood lumber business is slowly, but surely, taking the place of pine in this section. The last week over 2,000,000 feet of hardwood has been shipped from Menominee to Buffalo and Cleveland.

Business in the ore trade is enjoying a big, healthy rush just at present at rates that make the signers of summer contracts spend their idle moments in taking an occasional kick at themselves. The rate seems to hold strong at 75 cents to 80 cents with prospects of even a rise. The rush of boats has caused the dock officials and employes to set forth their greatest energy in giving arrivals the best possible dispatch, getting some of the big fellows out in record time.

A leak caused the whaleback Sagamore to be beached at this port last week after taking aboard a cargo of ore; and still another lucky victim to be added to the list of leaks was the barge Iron Cliff, which was discovered to have a heavy enough leak to cause a return to Escanaba from outside Poverty Island Passage last Saturday. A steam pump was put aboard and easily kept the water under control until B. C. Lindley, representing the insurance company, arrived and supervised the inspection, during which the trouble was discovered to be pretty well forward. After putting a canvas jacket over her bows she left for Lake Erie.

CLEVELAND.

Special Correspondence to The Marine Record.

The Supervising Inspector-General of Steamboats attended the boiler-makers' convention held here last week.

A dispatch from Duluth says that the wheat under charter at 3½ cents, September delivery, at Buffalo, aggregates over 2,000,000 bushels.

The old schooner Leader, reached port with lumber, leaking badly. Owing to a lack of pumping facilities she sank at her dock in about 20 feet of water. She is now being unloaded and will dry dock.

The steamer Mae, built by the Craig Ship Building Co., Toledo, reached New York, via the Welland canal, Saturday last. She will go into service between New York and Porto Rico, W. I. The Craig Ship Building Co. are building a sister ship for the same owners.

Mr. W. F. Mack denies having assaulted the late engineer of the Boutelle Transportation Co's. tug Sweepstakes. It was reported that he had knocked the man overboard, but instead he very properly and promptly discharged him for negligence amounting to incompetency.

The passenger travel out of this port is now on the boom, and as this month is always the best one of the year, records are to be made and gained on every route. It now looks as if the figures will show a larger number of people carried than ever before in one month during the history of lake navigation.

The report that the Northern Transit Co. is to build two speedy side-wheel steamers, to run down the St. Lawrence rapids, in connection with their lake line, is contradicted here. The Empire and Badger State have all they can do, and the lake service may be increased next season, but the river trade will not be taken hold of just yet.

Since the recent purchase of six vessels the Corrigan fleet now consists of six steamers and seven consorts or tow barges, as follows: Steamers, Caledonia, Italia, Bulgaria, Iron Duke, Iron Age, Iron Chief, consorts, Amazon, Australia, Polynesia, Tasmania, Iron Cliff, F. D. Ewen, John M. Hutchinson. Mr. John Corrigan owns the steamer Aurania, formerly a large steel tow barge.

The officials of the American Ship Building Co. had not quite decided, on Thursday morning, about launching the steamer building for Capt. John Mitchell and others at the old "Globe" yards, but the Minnesota line steamer, building at the Lorain yards, will take the water at 3 p. m. standard time. A later inquiry at Capt. Mitchell's office, also at the shipyards, placed the launch at 3 p. m., sun time.

Capt. Thomas Wilson left for Duluth, on Wednesday, to attend the funeral of his sister, Mrs. Capt. A. P. Woods, who died suddenly at Los Angelos last Friday of heart failure. Capt. Joseph Woods, master of ths steamer Volunteer, is a son of the deceased. Capt. Woods will go to Duluth with Capt. Wilson and Capt. Edward Morton, ships-husband of the Wilson fleet, will take the Volunteer around this trip.

Dredging work has thrown up quite a bar at the mouth of the river on which several incoming vessels grounded this week at the expense of detention and tow bills. The passenger steamer City of Erie, in trying to pass clear of the dredges, or rather a tug and a mud scow, swung into the pier and slightly damaged the light-house. It is said all round that dredging should be done early in the season when there is not such a rush of boats.

Capt. William Gerlach, manager of the Minch Transportation Co., has decided that his individual efforts to release the Minch will be abandoned. He has made a proposition to submit bids for the release of the schooner from the beach six miles west of Ashtabula, and for her delivery in Cleveland harbor. Capt. Gerlach said that this contract would either be made or the vessel would be sold right as she is on the beach. The Minch is still a good old craft and is worth floating again.

Ore shovelers at the Angeline docks, Ashtabula, stopped work for two hours on Wednesday. They asked 13 cents a ton for unloading the hard ore on the steamer Merida on account of the manner in which she was loaded. The advance was granted. It is now likely that all of the minor strikes at the several Lake Erie ore discharging ports is settled for the balance of the season, as the dock managers have granted the requests of the shovelers, or met them in such a way as to make them more contented to work.

United States Engineer Colonel Jared A. Smith, Corps of Engineers, U. S. A., in charge of the river and harbor improvements in this district, is properly indignant at the laxity of the city in securing land needed for harbor widening purposes. Col. Smith has acted with well-advised energy and shown the greatest possible engineering skill in his efforts to make Cleveland one of the best and safest ports on the chain of lakes, and it is very discouraging to find his work checkmated through the picayune bickerings of the present local administration. The city not acquiring the land necessary to carry out the improvements is damaging the shipping interests, and the evil effects are far reaching. Every effort should be made towards facilitating the work of widening the approaches to the port instead of delaying same through ill-advised litigation with local owners of the required strip of land.

No scare can be raised regarding an undue competition in the towing business of the lakes. Those who remain outside of the Great Lakes Towing Co. won't have a chance to either "fish or cut bait." The vessel pays all bills, and their owners are the King Bees in the towing combine as in every thing else concerning the property, just as they shouid be. This talk of towing competition or opposition is all humbug. It is like a source sending out a fancied notion of some incompetent to lake papers one day, and then having fun all the week correcting, denying and starting the notion off again on another tangent. Such has been the case all week with the towing question, and the "tramp" steamer combine story. The starter of the "tramp" excitement started it from the head of the lakes, St. Paul via Duluth, but it was soon recognized as a fake, pure and simple. Such yarns do no good, no harm either for that matter, they fill space though, and therefore give nothing for something.

Interviewing one of the most prominent of the vesselmen here yesterday, regarding an advance in wages for the lake engineers as suggested by the national president of the Marine Engineers' Beneficial Association, who wrote a letter to the executive committe of the Lake Carriers' Association, in which he said that heretofore the lake freights had always been the thermometer that measured the wages of the seamen. When the freights were low the seamen expected nothing but moderate wages. He said this seems to apply only to the market when it is low and spoke of a feeling of unrest on the part of the lake engineers and asking an increase of 12½ per cent. for the lake engineers, to take effect on August 1. This owner said: "Those who are best posted on the state of affairs says that Mr. Uhler, the national president, is mistaken in two ways. In the first place he forgets that 80 per cent. of the boats on the lakes are tied up until October, with contract ore at 60 cents per ton, and, therefore, are not getting the benefit of the wild rate just now. Hence they are not so prosperous as it might seem. They say also that he forgets that the seamen, and especially the engineers, had an advance in wages the first of the year, which covered the entire season, the advance in reality being out of proportion with the rates at which most of the boats are running. They say also that he has overlooked the fact that most of the engineers are engaged for the year at a fixed salary and that any increase now in wages would benefit but a very small per cent. of the engineers on the lakes, or those who shall make contracts with their employers from now on. With this in view his statement that there is dissatisfaction among the engineers seems not to be well founded." None of the larger owners has heard even a murmur of dissatisfaction from their engineers. On the side though, Mr. Uhler should coach up his typewriter to spell a little more correctly when sending out an important communication dealing with the business of the order, and not make it an "erra of phenominal," when he means to say a phenomenal era.

THE TIP TOP RECORD.

The steel tow barge John Smeaton, built this year at W. Superior, Wis., to the order of the Bessemer Steamship Co. carried 7,446 gross tons or 8,339 net tons of iron ore from Duluth to Cleveland.

MARINE PATENTS.

Patents on marine inventions issued August 1, 1899. Reported specially for the MARINE RECORD.

629,790. Door for ships' bulkheads. William Houghton, New York, N. Y.

629,902. Bridge. W. E. Gunn, Covington, Ky.

629,910. Submarine mining apparatus. E. C. Nichols, Topeka, Kan., assignor of one-half to W. C. Smith, same place.

629,935. Suspension bridge. N. H. Sturgies, Guthrie, Okla.

629,966. Steering propeller. A. T. Otto, Chicago, Ill., assignor to R. L. Stevens, Hoboken, N. J.

630,006. Wave-power, water-moving apparatus. John Rogowski, San Francisco, Cal.

630,038. Reefing apparatus for fore and aft sails. S. G. Dresser, Boston, Mass.

FOREIGN AND DOMESTIC CEMENTS.

The manufacture of cements of the Portland class having assumed such enormous dimensions within the last few years, a reference to their relationship with the original stock as produced in Europe will be of interest to those of our readers who have so kindly appreciated our late observations on this important industry.

American Portland cements differ from German or English in three essential points. Our people do not agree with this fact, but usually, one and all, claim that the home materials are identical with the European, and that the treatment being better they produced a superior article. On paper they evidently do, but if we compare the prices of the two goods we find that the average imported often commands a much higher price than the home-made product. A consideration of these three points will explain the reason.

First, then, the statement that our raw materials are the same as the foreign is sometimes true and more often not. Many cement mills are using raw materials of an impure nature such as no foreign maker would accept, and yet to hear and read their assertions one would think they produced the finest cement in the world. Some time ago it was found in an American mill that the raw materials had too much magnesia, but it was a surprise to find that the analysis exhibited for the finished product showed no such objectionable feature. Where had the excess magnesia gone to? A second mill announced that its natural raw material is, as quarried, the very acme of perfection, but as it goes on to say that a chemist is continually employed in watching and testing this perfect material it reminds us of "the lady who doth protest too much." It is known that some foreign mills have fairly reliable material, so much so in fact that they practically require no chemist. We suppose that those of our domestic mills using inferior, irregular, or treacherous material, will have to soon improve on their process and manufacture.

Our people have, unfortunately, often been very reckless, going to work on material selected for them by a professional chemist or engineer, having the smallest practical knowledge of cement making, but full of book learning and self confidence, they filling all positions of trust and responsibility with incapables whose sole recommendation was that they were stockholders. Under such arrangements they drift rapidly to ruin and on their way, in some cases, bring disgrace to the name of American Portland cement.

Then, as to burning, it is an old rule abroad that chemical combination of the raw materials of cement is best effected by a continued or soaking heat. Our people, however, largely ignore this idea, supported, as it is, by the evidence of workers in pottery and clay goods generally, and prefer a rapid burning. There is no doubt that the latter system has some advantage in cheapness as a set-off against the reliability of the other methods.

Lastly comes the question of reduction. It is an axiom that to do a certain amount of work a certain amount of power is required. There is no way of getting round this, but the market is flooded with a number of reducing machines, all represented as able to perform miracles. It is evident then that the power required by them is much under stated—as in a case brought under our notice recently where 55 horse-power was required to run a mill which the maker represented as only requiring 20!—or that the product is not ground but only crushed or pounded, a different thing altogether. Our makers and users might with advantage reflect on the different values of cements, one pounded and the other ground, and both passing a 100 per cent. sieve.

Portland cements can, therefore, be made as well in the United States as anywhere else, provided suitable raw materials only and the best means of treating them, are used. A disregard of these conditions is at the root of many of the complaints which are made against American Portland cements, and which "palm oil" can only cover up temporarily.

A SHOAL SPOT LOCATED.

Assistant United States Engineer J. H. Darling, Corps of Engineers, U. S. A., and party, have returned to Duluth from their cruise on the yacht Pickett, on which they started first for the purpose of investigating the location of a shoal off Raspberry Island, reported by Capt. Stone, of the steamer Roumania. The shoal was located and steps will be taken at once to have it properly marked by the Light-House Board. A chart showing the location of the shoal will be prepared by the engineering department and forwarded to the Light-House Board. There is about 17 feet of water at the shoalest spot and 20 feet at others. The reef is only about 50 feet wide, located about midway between Sand Island light and Bear Island light, about four miles off Raspberry Island, to the northwest, and about four and one-third miles east of Sand Island light.

SUN'S AMPLITUDES.

The following approximate amplitudes of the Sun's rising will be given each week in this column during the season of navigation. A second bearing may be taken by compass at sunset, by reversing the east bearing given for the nearest latitude, as the change in declination for a few hours makes but a slight difference in the true bearing of the Sun's setting. The bearing may be taken when the Sun's center is on the horizon, rising or setting. The three elements which may be obtained by taking these amplitudes are the quantities known as local attraction, variation and deviation.

LAKE ERIE AND S. END LAKE MICHIGAN, LAT. 42° N.

Sunrise.	Amplitudes.	Bearing P'ts.	Bearing Comp.
Aug. 3.....	E. 23° N.	= N. 6	E. = E. N. E.
Aug. 5.....	E. 23° N.	= N. 6	E. = E. N. E.
Aug. 8.....	E. 21° N.	= N. 6⅛	E. = E. by N. ⅞ N.
Aug. 10.....	E. 21° N.	= N. 6⅛	E. = E. by N. ⅞ N.

LAKE ONTARIO, S. END HURON AND CENTRAL PORTION LAKE MICHIGAN, LAT. 44° N.

Sunrise.	Amplitudes.	Bearing P'ts,	Bearing Comp.
Aug. 3.....	E. 24° N.	= N. 5⅞	E. = N. E. by E. ⅞ E.
Aug. 5.....	E. 24° N.	= N. 5⅞	E. = N. E. by E. ⅞ E.
Aug. 8.....	E. 22° N.	= N. 6	E. = E. N. E.
Aug. 10.....	E. 21° N.	= N. 6⅛	E. = E. by N. ⅞ N.

N. END LAKES HURON AND MICHIGAN, LAT. 46° N.

Sunrise.	Amplitudes.	Bearing P'ts.	Bearing Comp.
Aug. 3.....	E. 25° N.	= N. 5¾	E. = N. E. by E. ¾ E.
Aug. 5.....	E. 24° N.	= N. 5⅞	E. = N. E. by E. ⅞ E.
Aug. 8.....	E. 23° N.	= N. 6	E. = E. N. E.
Aug. 10.....	E. 22° N.	= N. 6	E. = E. N. E.

LAKE SUPERIOR, LAT. 48° N.

Sunrise.	Amplitudes.	Bearing P'ts.	Bearing Comp.
Aug. 3.....	E. 26° N.	= N. 5⅝	E. = N. E. by E. ⅝ E.
Aug. 5.....	E. 25° N.	= N. 5¾	E. = N. E. by E. ¾ E.
Aug. 8.....	E. 24° N.	= N. 5⅞	E. = N. E. by E. ⅞ E.
Aug. 10.....	E. 23° N.	= N. 6	E. = E. N. E.

With a compass correct magnetic, the difference between the observed and true bearing or amplitude will be the variation for the locality. Should there be any deviation on the course the vessel is heading at the time of taking the bearing, the difference between the observed and the true amplitude after the variation is applied will be the amount of deviation on that course. If the correct magnetic bearing is to the right of the compass bearing, the deviation is easterly, if to the left, the deviation is westerly.

AUGUST ASTRONOMICAL DATA.

Astronomical data for August, 1899, furnished THE MARINE RECORD by the Washburn observatory:

Mercury passes through inferior conjunction on the morning of August 19, which changes the planet from an evening to a morning star. By the close of the month, if the sky is very clear, Mercury may be seen rising before the sun and from a point of the horizon a little farther north. Venus rises shortly before the sun appears and at nearly the same point of the horizon. As the planet has approached superior conjunction its disk has become more fully illuminated, until in the present month it appears almost as a full moon. Mars is seen low in the west in the early evening; but the continuous planets of the evening sky are the brilliant Jupiter in the southwest and Saturn almost due south in the early evening.

The times of sunrise and sunset for the month at Milwaukee are as follows:

	SUNRISE.	SUNSET.
August 1.....	4:42	7:13
" 11.....	4:53	7:00
" 21.....	5:03	6:45
" 31.....	5:14	6:28

The time of the moon's phases are:

New Moon.....	August	6,	5:48 a. m.
First Quarter.....	"	14,	5:54 a. m.
Full Moon.....	"	20,	10:45 p. m.
Third Quarter.....	"	27,	5:57 p. m.

The principal fixed stars visible during the month in the evening hours are: To the west, Arcturus, Antares; near the meridian, Vega; to the east, Altair and the bright stars of the constellation Casiopeia, of the Northern Cross, and the Square of Pegasus.

Agreement to Accept Payment for Repairs out of Earnings of Vessels.—The refusal of the managing owners to pledge their personal credit for repairs does not justify an inference of the existence of a maritime lien, where the repairer agrees to accept payment out of the earnings of the vessel as they accrue. The Jennie Middleton, 94 Fed. Rep. (U. S.) 683.

SHIPPING AND MARINE JUDICIAL DECISIONS.

(COLLABORATED SPECIALLY FOR THE MARINE RECORD.)

Maritime Liens—Repairs in Foreign Port.—Where repairs are made in a foreign port by order of the managing owners, the presumption is against the existence of a maritime lien. The Jennie Middleton, 94 Fed. Rep. (U. S.) 683.

Maritime Liens—Money Supplied to Vessel.—The maritime law gives a lien for money supplied for the use of a ship and necessary to enable her to proceed on her voyage similar in all its essential features to maritime liens for other kinds of necessary supplies. The Evangel, 94 Fed. Rep. (U. S,) 680.

Action for Collision—Both Vessels in Fault.—Where, on a libel for collision, both vessels are held in fault, and, libelant's vessel alone having been injured, no cross libel is filed, and libelant recovers half his damages, each side will be allowed one-half its taxable costs. The Edward Luckenback, 94 Fed. Rep. (U. S.) 544.

Surety on Release Bond—Subrogation.—The effect of a bond given for the release of a vessel after its seizure by a court of admiralty in a suit in rem is to extinguish the lien of the libelant on the vessel, and a surety on such bond who pays the claim of the libelant after the vessel has been sold in subsequent proceedings to enforce other liens does not by such payment become subrogated to any right in the fund produced by the sale. The Evangel, 94 Fed. Rep. (U. S.) 680.

Effect of Sale of Vessel in Admiralty.—All liens upon a vessel, whether impressed by general maritime law or local statutes, or created by bonds or mortgages, are completely and finally extinguished by a sale of the vessel pursuant to an admiralty decree in rem, and no lien for a pre-existing debt can thereafter be created or revived, so as to become enforceable against the fund produced by the sale, to the exclusion of creditors whose liens were fixed before the sale. The Evangel, 94 Fed. Rep. (U. S.) 680.

Maritime Contracts—Suit for Services in Procuring Charter—A court of admiralty is without jurisdiction of a suit to recover compensation for services rendered in procuring a contract of affreightment for a vessel, the contract for such services not being maritime, but merely preliminary to a maritime contract; and it does not become maritime because of a provision of the charter party for the payment of the broker's commission and reciting that it is due by the vessel. Richard et al. vs. Hogarth et al., 94 Fed. Rep. (U. S.) 684.

Maritime Liens—Evidence to Support.—A claim for maritime lien for money advanced at the special instance and request of the master, will be denied where the deposition of claimant does not show at whose request the money was advanced, and it does not appear that the advancement was necessary for the navigation of the vessel, and neither the master of the vessel nor the agent through whom the money was paid are examined as witnesses, and the only evidence is the unsatisfactory testimony of claimant, as such liens are strict juris, and will not be extended by implication or construction. The Clara A. McIntyre, 94 Fed. Red. (U. S.) 552.

Admiralty Jurisdiction—Suit Between Foreigners.—The admiralty courts of the United States have jurisdiction over suits between foreigners, if the subject matter of the controversy is of a material nature, and the ship or party to be charged is within the jurisdiction of the court. It is a jurisdiction the court may decline to exercise if for some special reason it appears to be inexpedient to exercise it, but a suit by a foreign marine insurance company against a vessel within the jurisdiction of the court, based on a right claimed under a policy of insurance issued in the United States, is one of which the court is not justified in declining jurisdiction. Fairgrieve et al. vs. Marine Ins Co. of London, 94 Fed. Rep. (U. S.) 686.

Parties to Suit for Collision—Suit by Underwriters.—Where a marine insurance company has paid the full value of an injury to a vessel by collision caused by the fault of another vessel, so that there are no other claimants entitled to sue for the tort, it is subrogated to the right of action of the insured, and may maintain a suit against the offending vessel in its own name; but, when the value of the property destroyed exceeds the insurance money paid, the suit must be brought in the name of the insured, who may recover for the entire loss, as trustee for the insurance company as to the amount it has paid, and in his own right as to the remainder. Fairgrieve et al. vs. Marine Ins. Co. of London, 94 Fed. Rep. (U. S.) 686.

Shipping—Injury to Cargo—Seaworthiness—Effect of Harter Act.—Section 3 of the Harter act (2 Supp. Rev. St. p. 81) does not relieve the owner from the duty of furnishing a seaworthy vessel at the beginning of the voyage, nor affect his liability for damage to the cargo arising from unseaworthiness, but only exempts him from liability for damage arising from the risks therein designated when due dilligence has been used to make the vessel seaworthy, etc. There is no expressed intention in the statute to replace the carrier's obligation under the general maritime law to furnish a seaworthy vessel by the less extensive obligation to exercise due dilligence to that end, and it cannot be extended by construction beyond its terms. Farr & Bailey Mfg. Co. vs. International Nav. Co., 94 Fed. Rep. (U. S.) 675.

TO STOP THE POLLUTION OF WATERS.

The threatened fight against the Chicago drainage canal has been started at St. Louis, by the adoption of a resolution by the municipal assembly instructing the city counselor to take legal steps "to enforce the rights and protect the interest of St. Louis." It is stated that application for an injunction against the use of the canal will be made to the Federal Court in Illinois at an early day. In view of the possibility that there may result from this action one of the most famous legal battles in the history of the pollution of rivers, we give the resolution in full as follows:

Whereas, The city of Chicago has constructed a channel and proposes to use it as an outlet by which the sewage of the entire city of Chicago for all time to come is to be discharged into the valley of the Desplaines river, and whence, through the Illinois river, the polluted waters will reach the Mississippi river, about forty-five miles above St. Louis:

Whereas, It is proposed to discharge the sewage of Chicago through this channel without any attempt at purification other than the very uncertain benefit which may come from certain proportions of dilution;

Whereas, The carrying into effect of the scheme as above outlined must materially affect the interests of St. Louis injuriously, and also perhaps in a greater degree the interests of the neighboring cities, Alton and East St. Louis, by polluting the only source from which water supplies can be taken:

Whereas, Sanitary and medical science has demonstrated that the epidemics and diseases most to be feared are directly produced by the polluted water supplies, and waters once polluted, will never by natural processes be made safe for drinking purposes, it must necessarily follow that the pollution of the sources from which St. Louis and its neighboring cities must take their water supply is an irreparable injury, which cannot be compensated for and must be prevented; and, therefore, be it

Resolved, That the city counselor is hereby instructed to take such legal steps as may be necessary to enforce the rights and protect the interests of the city of St. Louis.

There is, however, another side to the question, one of the canal trustees is quoted as saying:

The injunction suit brought by the city of St. Louis to restrain the trustees of the sanitary canal from turning in the water from the lake is going to be productive of good results in quieting the fear that has so long existed along the Illinois Valley. The people have been living in dread for two years, not knowing that the conditions would be improved rather than made worse. "As the matter stands now, St. Louis is getting all of Chicago's sewage. It is getting it in its most poisonous and dangerous form through the old Chicago and Michigan Canal, as everyone knows who is familiar with the situation. Now, then, to secure an injunction it must be sworn that an evil, a damaging condition is threatened which does not already exist. Accordingly, St. Louis can not get an injunction, for St. Louis is already getting our sewage.

"When the case comes into court, in a few words it will resolve itself into this: By the opening of the drainage canal the poisonous sewage which Chicago is dumping upon St. Louis in its original and most dangerous form will be diluted by 300,000 cubic feet of water per minute."

As far back as 1820 the government made a survey which was the first step towards the present Illinois and Michigan canal (which, however, must not be confused with the new canal now nearing completion) work was begun in 1836, and the canal was opened in 1848, at a cost of $6,000,000. It is 60 feet wide, 6 feet deep, and has 15 locks from Bridgeport to La Salle, the latter place was the head of navigation at the time of the completion of the canal. It was turned over to the state in 1870, up to which time it had proved a financial success to its promoters. Eventually this canal became too small for its purposes. In May, 1889, the Illinois Legislature passed the drainage canal bill, on May 29 the Governor signed it.

The bill provided for the present drainage district, which takes in most of the City of Chicago, and included 180 square miles. It provided for the erection of the canal and made the width dimensions 160 feet, provided that there should be a flow of 20,000 cubic feet of water per minute through this canal for every 100,000 population in the drainage district. The stream of water produced was to be maintained in a sanitary condition. All obstructions to navigation were to be removed, and it was specifically provided that the two dams should be removed. All damage to property was to be paid by the sanitary district. Mr. Lyman E. Cooley was the chief engineer.

The history of the project involves the relation of the conditions which made it a necessity for Chicago. Practically the drainage canal is an immense open ditch, extending from Bridgeport, on the Chicago river—a part of Chicago—to Joliet, Ill. The canal is 29 miles long and of varying width and depth. It has been dug and dredged and quarried through solid rock, swamps, drift and sand, and will receive water from Lake Michigan and connect the lake with the Illinois river some time in December next. No public work in the world approaches it in magnitude. The controlling works at Lockport are greater than ever before designed. The valley through which the canal passes is that of the Desplaines river, a stream which can be contained in a 6-inch pipe at certain seasons in the year, while at others it pours a flood of 600,000 cubic feet per second into the Illinois. The first work of the commission was to straighten out this river and make a new channel for it, which would not conflict with the proposed route of the canal. This accomplished, dikes were built to keep it in the desired channel, and the actual work on the canal which has cost $33,000,000 and is now so near completion was begun.

Eminent members of the Society of Western Engineers who have given the progress of the drainage channel close study, feel the $33,000,000 already expended upon that work must be followed by an expenditure of at least $50,000,000 more by the Federal Government and the State of Illinois towards making the river and the channel a complete waterway, one which will not create perpetual damage claim suits against the sanitary district, and which will satisfactorily dispose of all the water and waste emanating from the city of Chicago and every community upon the banks of the two streams.

IRON ORE PRODUCTION.

The report of the geological survey on the production of iron ore for the year 1898 has been completed by Special Agent John Birkinbine. The year recorded the maximum iron ore production for the United States, a total of 19,278,369 long tons. This was 1,760,323 long tons or 10 per cent. in excess of the previous maximum of 17,518,046 long tons produced in 1897, and over one and a quarter million tons above the record for Great Britain in 1880 when 18,026,049 long tons were mined. The ores of the British isles also average lower percentages of metal than those exploited in this country, and, therefore, represent a smaller pig metal product.

The variety of iron ores produced includes red hematite, the output of which was 83 per cent. of the total, and brown hematite, which was 10.3 per cent. of the aggregate product. Magnetite and carbonate ores make up the remaining 6.7 per cent.

The total output in long tons of all varieties by States was: Michigan, 7,346,846; Minnesota, 5,963,509; Alabama, 2,401,748; Pennsylvania, 773,082; Tennessee, 593,227; Virginia, 557,713; Wisconsin, 509,645; Colorado, 318,480; New Jersey, 275,438; New York 179,951; Georgia and North Carolina, 160,083; Montana, Nevada, New Mexico, Utah, and Wyoming, 55,969; Missouri, 50,000; Ohio, 43,868; Kentucky, 12,913; Connecticut and Massachusetts, 20,251; Texas, 9,705; Maryland, 5,941.

THE SOLAR ORB.

Hitherto an absolutely mistaken notion seems to have been accepted regarding the make-up of the sun, which has been supposed to be a homogeneous body in density throughout. Prof. T. J. J. See, of the U.S. Naval Observatory, says:

"As a matter of fact, while its material is lighter than our own atmosphere on its surface, the interior is very much denser than the heaviest known substances that go to compose the earth. In fact, the solar orb near its center is about three times as dense as mercury. As for the future of the sun, we may suppose that for a while, after cooling, it will become habitable by living forms, animal and vegetable; but these are not likely to be developed highly or to endure for any length of time, inasmuch as the mighty globe will have no external source of heat to depend upon.

The greatest and most important invention to be made in the next century will be a machine for storing the heat of the sun and transforming it into electricity or some other form suitable for ready employment. This heat, which is now permitted to go to waste, will be applied to the running of mills, the warming of houses, and every other purpose for which energy is utilized. It is worth mentioning in this connection that every square yard of the sun's surface emits an amount of heat equal to that of a blast furnace consuming one ton of coal every ten minutes. The heat given out by the solar globe in one second would raise 195,000,000 cubic miles of ice-cold water to boiling point, and of this heat the earth receives only 2,000,000,000th part.

SOME ASTRONOMICAL NOTES FOR AUGUST.

The conditions are still favorable for observing the heavens, either with a telescope or without one. The atmospheric conditions have also been unusually good recently, and the disappointing clouds have not been quite so persistently present as they frequently are.

Jupiter and Saturn, the two largest planets of the solar system, are objects of especial interest at this time, as they are both favorably situated for telescopic observation in the evening. Jupiter has long been the brightest planet in our evening sky. Only Venus, when at her best, can out-rank him in this respect. When seen through a telescope, only Saturn can be considered in any sense a rival. In variety of the scene presented no other planets can compare with Jupiter by reason of his wonderful satallite system. The writer thinks that he has never seen two views of the planet not on the same evening that were identical. Decided changes may sometimes be observed in a few hours' observation.

As the orbits of the satellite lie nearly in the plane of the planet's equator, and the equator forms a very small angle with the plane of earth's orbit, we see them projected in nearly a straight line in all possible relative positions.

Sometimes all are on the same side of the planet; and again, two are on either side; then the order is three and one. Frequently only three are visible, the missing one being either eclipsed, behind the planet, or in transit. Less frequently only two are to be seen, and very rarely only one is to be found. On very rare occasions Jupiter is seen apparently without a satellite. The fifth satellite is never seen except by the aid of the largest telescopes.

Mars may still be seen toward the west in the early evening, but he is scarcely recognizable by reason of his slight resemblance to the beautiful red planet known by that name a few months ago.

Venus, that has so long been our bright morning planet, is slowly passing from view, and before the close of the month she will be lost in the rays of the sun.

Mercury will be in too close proximity to the sun to be easily seen during the month.

The principal stars are nearly the same as last month, though they have all drifted about 30 degrees toward the west. They are: Arcturus in Bootes, Regulus in Leo, and Spica in Virgo west of the meridian in the early evening, though Regulus is too near the horizon to be easily recognized. Near the meridian and east of it in the early evening are: Antares in Scorpio toward the south, Vega in Lyra nearly overhead, and southeast of Vega Altair in Aquila.

We may not have realized that a starry crown (Corona Borealis) has been suspended above our heads most of the past month and will continue to be found in similar position during most of the present month.

The supposed baleful influence of the Dog Star will probably be at its maximum during August. Toward the northeast Cassiopeae seems to sit uneasily in her starry chair, and in the northwest Ursa Major with the Great Dipper may be seen rushing apparently pell mell down the heavens. But we know the confusion is only apparent as Ursa Major always holds the even tenor of his way as he pursues his csaseless journey around the pole.

Comparative quiet seems to have been the prevailing condition on the sun during the past month, if the absence of spots indicates such a condition, as only one small group has been observed.

The full moon in August, though not the harvest moon, has some of its characteristics, and for a few evenings, including that date, our faithful satellite will seem to be giving us extra service.

From the fifth to the fifteenth are supposed to be favorable dates for the display of the August meteors. The exhibit is not often very marked, but the number seen at that time is generally above the average and sometimes the display is quite brilliant.

D. SATTERTHWAITE.

Toledo, Ohio.

A sailor on the steamer Idlewild stepped on a banana peal while she was lying at the dock, went into the river like a streak of goose grease going down a baby's throat. A "cop" on the dock saw the affair, threw the poor rat a life preserver, yelled like a coon at a colored camp meeting to hang on and he would "be saved," when the poor man was fished out of beautiful water half dead.—The Sunday Herald, Port Huron.

MARINE RECORD

ESTABLISHED 1878.

Published Every Thursday by

THE MARINE RECORD PUBLISHING CO.,

Incorporated.

C. E. RUSKIN, - - - - - Manager.
CAPT. JOHN SWAINSON, - - - Editor.
THOS. WILLIAMS, Chicago, - - Associate.

CLEVELAND, Western Reserve Building. CHICAGO, Royal Insurance Building.

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Western Reserve Building, Cleveland, O.

Entered at Cleveland Postoffice as second-class mail matter.

CLEVELAND, O., AUGUST 3, 1899.

THE Britishers now talk of building a large steamer of aluminum. France has experimented with the metal in the construction of torpedo boats.

IT IS remarked that the American shipping industry is in a condition of exceeding prosperity at the present time. It is even stated that every shipbuilding firm in this country has orders on hand to keep it busy from one to three years. The subject has attracted the attention of Great Britain, and, in view of the fact that an American firm has recently furnished to Belfast builders a large consignment of ship-plates, it is said in an authoritative quarter that "the British technical journals are universal in the concession that in the United States is to be found the futnre rival of Great Britain as a shipbuilding and shipowning nation."

THERE is a Canadian statute to the effect that ashes or refuse must not be thrown overboard when the vesel is in less than 12 fathoms of water. It is now sought to reduce this depth to 7 fathoms. It is safe to say that hundreds of tons of ashes are dumped overboard each day throughout the season of lake and river navigation in much shoaler water than even 7 fathoms. As a matter of fact and practice, it is the exception to see any ashes landed anywhere. There is always two sides to a boat, and there is a night time as well as daylight. Dumping ashes in shoal water is a great wrong and owners should call the attention of their chief engineers to this phase of the matter.

THAT prize for life-saving appliances will no doubt be split up into a good many parts. There are several excellent devices already invented, which, for one reason and another, are not in general use. Attention will no doubt be turned to boats, chocks, davits and davit tackle falls. This equipment is important, also invaluable when a ship has to be abandoned in a hurry. The United States Army Transport service, after going thoroughly over the field of inventions is now engaged in equipping its fleet with a patent automatic detaching hook for the lower block of the davit tackles, they have found nothing better, in point of fact and actual working practice nothing near as good ; by a rather unique way of reeving the falls, the boat becomes detached at both ends the instant that either end is waterborne. The hook is a capital one, a sailor's friend and a mute life-saver. It is endorsed by nearly all the departments of the United States government, as well as the most prominent lines in the merchant service and on the principal passenger lines of steamers, lake, coast and ocean. If there is any grant or special mention made of the necessary equipment for saving life, this hook deserves an extended notice.

PRIZES FOR LIFE SAVING DEVICES.

The loss of the French Atlantic liner La Bourgogne has been the means of placing a $30,000 reward on the market, to be awarded to the inventor or manufacturers of the best life-saving devices.

To avert a repetition of the late casualties accompanied by great loss of life, a prize of $30,000 is offered by kinsfolk of the late Anthony Pollok and his wife, who perished when the Bourgogne foundered. Through diplomatic channels the relatives of Mr. and Mrs. Pollok, living in Paris, transmitted to Secretary Hay, to be transferred to Chas. J. Bell, trustee and manager of the Pollok estate in Washington, the above named sum to be by him employed as he should deem well for the purpose. Of this money $20,000 was directed to be given as a prize for the production of the invention, while the remainder is to be used in extending the information obtained through the competition.

This is a most praiseworthy departure and it is to be hoped that the competition will be keen and aggressive, also, that the judges of the merits of the appliances will be experienced and broad minded men, not people with "axes to grind" for themselves or others, not incompetent fossils holding sinecure offices, who by virtue of their standing might fraudulently inject their views as judges, and positively, not men who are to be influenced in any way by the purty pelf, the long green, that is to say, the filthy lucre.

The trustee of the Pollok estate will have all that he can do to steer clear of those gifted with more tongue than brains or experience, also, may he be duly warned against the wily, and usually oily, promoter, who might lend his best efforts towards arguing that the finest way to rescue a castaway or drowning person was to stand at a safe distance and harpoon him, or to tow a string of life-boats astern in case anything happened to the large boat, etc. In any case, Mr. Bell has his work cut out for him, and his only safeguard is in having a proper and thoroughly qualified committee to assist him in laying bare the de-merits of the thousand and one notions which we expect will be put before him, and all guaranteed to do their work in the most expeditious manner possible.

ENGINEER Lyman E. Cooley, than whom we presume there is no more talented scientist in the country, seems to speak of, or treat the subject of lowering lake levels rather cavalierly. In a quoted interview L. E. Cooley said: "The outflow of water lowering the level technically three or four or six inches, should not be noticed by the navigator." Quotations taken from the body of an article, address or speech are sometimes liable to be misconstrued, but, in this case we have quoted literally. Again, Mr. Cooley speaks of seasons, waterfalls, droughts, snowfalls, winds, evaporation, barometric conditions and precipitation as ruling the level of the lakes, all of which may be summed up in the latter quantity—viz. precipitation, and the records are not inclusive, therefore, not conclusive enough on this point It is this feature on the subject of lake levels that creates the dire uncertainty of the effect of opening extra sluice gates to drain the lakes, as, with an immediate actual lowering of several inches, those interested in drawing a large supply of water from the lake would point out the apparent fluctuations of level in certain months, at particular localities and extending over marked periods of low levels, etc. Viewing the question from a practical instead of what might be termed an academic standpoint, a person would say, that, given the amount of precipitation, evaporation and natural outflow, the lake level could be fairly accurately determined, or at least made known to such a degree that any large extra waste would be appreciably shown. We are much afraid that the present information regarding these two former features will be found insufficient to early or easily detect a most dangerous waste of supply.

AND now there is talk about placing a 35-knot turbine propelled steamer on a Lake Michigan route. Here is a chance for the Postmaster-General to facilitate the delivery of mail matter, and, incidentally, do his share towards helping to establish a new shipbuilding industry. A mail contract entered into with a syndicate of capitalists who would put afloat a fleet of 40-knot turbine driven dispatch boats, specially for carrying mail on the lakes, would be a marked innovation and a vast commercial benefit, later, distance may be annihilated by shooting mail matter across the lakes in a pneumatic tube, but a dozen turbine wheels keyed on to a shaft is the quickest and best way for the present.

CANALS are now the order of the day, both in the United States and the Dominion of Canada. The St. Lawrence system of canals permitting a fourteen feet draft, was to have been opened this month. The immense Chicago drainage canal, and incidentally, the big ship waterway, is to be completed a month or two later. The Deep Waterway Commission is exceedingly active at this time in finding a route to carry a draft of thirty feet to the coast. The special committee on New York State Canals have about completed a canvass of the entire situation. The Federal officer in charge of the district recommends another St. Clair Flats Canal, for which by the way, there is more occasion than there is for treble locks at the "Soo." The Portage Lake Canals, Lake Superior, are being made first-class artificial waterways and such a movement is also being made in connection with the Sturgeon Bay Canal, and a Michigan-Ohio Canal is talked of. Besides the lock at St. Mary's Falls Canal, a Canadian project calls for a canal between Georgian Bay and Lake Ontario, known as the Hurontario, also the Lake Erie and St. Clair connection. Not so much is heard now regarding the Conneaut, Lake Erie-Pittsburgh scheme, as that seems to have flattened out since Mr. Carnegie dispossessed himself of his interests in the trade. There are several other minor affairs wafting in the air, but enough has been pointed out to show our canal aspirations and proclivities at this time.

THE West Indies service of the U. S. Weather Bureau, Department of Agriculture, does not seem to have fallen into harness yet, judging from the reports of that San Domingo hurricane that came whistling unheralded and unsuspectedly along on Friday last. Three large schooners took all hands, with the exception of one man who was left to tell the tale, and the island was horribly demoralized through the great damage caused by the apparently unannounced hurricane. The bare fact that the United States has established a branch of its weather bureau service in the West Indies, will by no means diminish the frequency or furiousness of these blows during the hurricane season. They will come along just about as they always have done, only these unwelcome visitors can at least be announced, without finding or being given the entertainment of demolishing a fleet of merchant vessels with their crews, or indulging in any other death dealing evolutions.

Much credit is due to the master of the steamer Rust, Capt. Leaver, owned by Mr. Sullivan, Toledo. The Rust sighted the engineer of the tug Ruelle, which had foundered some hours previously in Saginaw Bay. He was taken aboard, and the body of the captain was also recovered. The Toledo Blade says: "Capt. Leaver is one of the best known masters on the chain of lakes. He is president of the Shipmasters' Association here. The saving of the engineer is characteristic of him. He is a man of great determination, an excellent navigator and a thorough gentleman." Capt. Leaver is entitled to the thanks of the community for his humane efforts, notwithstanding he may some time want the same assistance himself, but I hope not.

FOR the fiscal year ended June 30, 1899, the records at St. Mary's Falls canals show that 16,302,901 registered, and 18,971,556 freight tons passed through that "link to the lakes." For 1898, in 228 days, the figures show four million freight tons less, or about one-third of the tonnage passing through the St. Clair Flats canal. The total number of vessels locked through during the fiscal year of 1898 was 13,411 in 6,258 lockages, and for 1899, 14,001 in 7,191 lockages, which shows the passage of two vessels for nearly every swing of the lock gates, at a cost to the federal government of $88,410, of which $55,829 was for labor and $22,277 for repairs. The expenses of the Canadian lock is not yet given out.

WHEN it is considered that about 80 per cent. of the lake tonnage was chartered before navigation opened, it is easy to see why and how the free tonnage is permitted to advance freight rates. It is known that a large portion of the tonnage that was fixed ahead will complete their charters next month, others run through October, but then the standing part of the season will be over and the weather will soon be getting unsettled, with probable hard weather a little later on. Besides, shippers have always found it poor policy to try to crowd cargoes ahead during the latter portion of the season of navigation.

PRECIPITATION—EVAPORATION.

At last, attention is being turned to the subject of lake levels, and, while the time is all too short to accurately determine and substantiate the data already collected, enough is known to show any artificial causes of disturbances, such as is suggested by the various canal projects in course of completion, commenced, and others for which franchises are asked, etc.

The annual variation of surface levels for Lakes Superior Michigan and Huron, as determined by the United States Deep Waterways Commission, is based on observations of water level made under the direction of officers of the Engineer Corps, United States Army, and published both in the annual reports of the Chief of Engineers and the report of the United States Deep Waterways Commission, 1896. The subject of variations in lake levels and atmospheric precipitation is also being investigated by a division of the Weather Bureau, Department of Agriculture.

On the meteorological chart of the lakes for August, Chief of Division Alfred J. Henry, furnishes considerable data regarding precipitation and evaporation from which we take the following excerpts:

The course of the non-periodic fluctuation during the years 1862-65 was downward, the fall being slightly checked in 1866-67 by an increase in precipitation. From 1868 to 1870 the lake level rose, apparently responding to the heavy rains in portions of the lake region in 1869. From 1870 to 1872 the rainfall was considerably less than normal, and the effect is shown in the downward course of the lake level curve. A period of increased rainfall began in 1872, continuing until the end of 1876. The lake level rose in apparent response to the increasing rainfall, the crest of high water and the time of greatest rainfall occurring almost coincidentally in the summer of 1876. From 1877 to 1879 the three upper lakes fell, the fall being well-marked on all of them. Low water of the winter of 1876-77 on Lake Superior was not reached until April, 1877. The fall in the level of that lake from low water of 1876 to low water of 1879 was over a foot. The rainfall at the beginning of the period in the Superior basin was more or less deficient, yet for the three years, at a majority of the stations, it was slightly above normal, although less than that of 1876. The depression of over a foot in the general level of Lake Superior, a lake presumably not affected by conditions which may exist outside of its own watershed, is not easily explained. It is true a fall from the high water of 1876 was to be expected, yet we should hardly expect a fall so disproportionate to the actual diminution in rainfall.

The unknown causes which might have contributed in a measure to the depression are (*a*), very great evaporation from the lake itself; (*b*), an unusual outflow or discharge; and (*c*) the effect of temporary winds in changing the level of the water.

We do not know whether causes (*b*) and (*c*) contributed to the fall in the level of the lake or not. As a matter of personal opinion we should say very little, if any. The effect of cause (*a*) might have been considerable as we shall attempt to show.

The amount of evaporation that takes place from the surface of the body of water depends chiefly upon the dryness of the air, the wind velocity, the temperature of the evaporating water, and the superincumbent air. Lake Superior, by reason of its abnormally cold water and the relatively cool stratum of air immediately above it, possesses less energy of evaporation than the remaining lakes. * * *

Unfortunately we have no direct measure of the amount of water evaporated from the lake during the years in question, but we can arrive at approximate results indirectly.

In the summer of 1888 observations of evaporation by Piche evaporometers were made in the lake region and elsewhere in the United States. These observations were discussed by Prof. Thomas Russell in the September, 1888, Monthly Weather Review, wherein he deduces a formula for the computation of the possibilities of evaporation from the readings of the wet bulb thermometer and other observed data. * * *

We thus see that during the warm, dry year, 1878, the atmospheric conditions were such that it was possible for 34.7 inches of water to have evaporated from the lake, being a little over 10 inches above the amount that was possible during the 12 months, July, 1887, to June, 1888, and about 2 inches more than the normal annual precipitation. As the conditions which existed on Lake Superior, in 1878, doubtless extended over the greater part of the upper lake region, we may safely assume that the evaporation played an important part in producing the low water of 1877-1879.

LAKE FREIGHTS.

There is a firmer feeling in the freight market this week than for some time past. The iron ore rate is fixed at $1 from the head of the lakes, as compared with 60 cents paid to vessels fixed ahead since the opening of the season. Marquette, 90 cents, and Escanaba, 75 cents, with an increase looked for. Tonnage is in good demand.

Chicago grain shippers squirmed at the 2-cent rate on corn and tried every possible way to break the even figure. They succeeded for a couple of days and then tonnage was sent for ore, with the result that they are now well satisfied to pay the 2 cents to Buffalo with fairly brisk chartering. Duluth to Buffalo 2¾ cents, an advance of 1¼ cent, with September charters at 3½ cents on wheat which is equal to about $1.30 on ore. Toledo to Buffalo, wheat, 1½ cents. Coal shippers find that vessels now desire a slight margin for detention and other expenses incidental to loading, carrying and discharging coal. Buffalo has met the situation, but it goes hard with Ohio shippers to meet the cost of carriage and it is possible to go harder before the season closes, whether they made their contracts for delivery ahead or otherwise. The going rate to Chicago-Milwaukee from Buffalo or Cleveland is 60 cents with an increase to minor ports, such as 70 cents Racine, Kenosha, etc. A Toledo cargo to Milwaukee paid 65 cents, but this is not considered the going rate. The report from Buffalo that 50 cents is being paid on anthracite to the head of the lakes stopped the 40-cent going rate from Ohio ports on bituminous, and 50 cents is now asked and likely to be had in a day or two, as vessels prefer handling hard coal anyway, and more especially so at a 10-cent better rate; 50 cents has been offered on a several trip charter, but not for single cargoes, and 40 cents is nominally the going rate from Lake Erie ports. Erie to Escanaba has paid 50 cents. Lumber rates are firm and chartering brisk at $2.25 per M. feet from the head of the lakes.

THE CARRIAGE OF COAL AND IRON ORE.

Coal miners and shippers have always had vessel owners on the hip. It is only recently that owners had to pay two prices for fuel so as to secure the privilege of getting a cargo of coal at ballast carrying rates. The greatest trouble that the coal shippers had was to see that their competitors were not receiving a bonus for providing cargoes, there being too many offers to carry it comparatively gratis. It was the old feature over again, better carry coal west for nothing, than to lay up, or pay for ballast, so as to reach the paying eastbound freight.

For once it must be conceded that neither the coal miners nor the shippers are now masters of the situation. The advance is solely due to the inability of the mining companies to lay down coal in the west. At the mines in Pennsylvania, which is the one place where anthracite coal is mined, the men are working only three-quarters time, and still the docks are piling up, with no prospect of shipping it to the markets along the lakes by water. If it becomes necessary, as it would appear from the present outlook, to ship anthracite coal from mines to the northwest by the all rail routes, dealers say the prices will be greatly advanced.

To offset the iron ore freight rate, if possible, the coa men offered 28 cents a ton for carrying coal at the beginning of the season, an advance of 10 cents a ton over the figure that ruled last season. The rate has jumped every month since the opening of navigation, and the price now paid is 50 and 60 cents a ton.

Heretofore it has been claimed that the high prices asked for coal in the west and northwest, have, in a measure, been due to combines, strikes and lack of supply. This time the statement is made that the transportation companies have contracted to handle iron ore in such quantities that the carriage of coal is impossible. It is said that the iron furnaces, in order to fulfill contracts on hand, will require to have 2,000,000 tons of iron ore every month until the close of navigation. To meet this enormous demand made upon them the iron companies opened the season by making contracts with vessel owners to devote their craft solely to the iron ore trade, it being stipulated in the contract that they should make the return trip from the port of delivery to the iron ore docks light, instead of following the old custom of carrying coal on the return trip. This was done to prevent the loss of time incidental to the loading and discharging of coal cargoes. The vessels now take water ballast on the return trip, and pump it out when they load with iron ore. In some instances vessel owners entered into contracts to deliver a certain amount of iron ore at the furnaces during the season, and in nearly every instance the amount was placed so high that the contracts will not be completed until late in October.

There is every indication that considerable coal will be shipped west this winter all rail. It is even said that the coal companies are already negotiating with the railroads for contracts to haul coal, and those contracts that have been closed are to hold good all winter. If such is actually the case the westerners will have to pay a steep price for their next winter's fuel supply. It is now possible that after this salutary lesson has been taught to coal shippers they will figure on paying a fair living rate on coal in the future.

LETTERS AT DETROIT MARINE POST OFFICE

AUGUST 2, 1899.

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Campbell, H. J., Wright.
Clark, Geo., Martha.
Carey, Paul, Thomson.
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Taylor, E. D.
Washburn, Orma, Whitworth.

FLOTSAM, JETSAM AND LAGAN.

The steam yacht Consuelo, owned by T. H. Rafferty, burned on Monday night near Alexandria Bay. She is considered a total loss.

Carrying away stamp sand from the Houghton mines is giving work to many vessels. About 10,000 tons of rock are crushed every twenty-four hours.

Assistant Secretary of the Treasury Spaulding has remitted the fines imposed on the C. W. Endress, Peter Coates, E. M. B. A., Tempest and River Queen, whose owners were fined $500 each for not having the vessels inspected according to law.

The wooden steamer Tampa, wrecked on the north shore of Lake Superior last November, has been placed in dry dock at Bay City by the underwriters. She is found to be in much better condition than had been anticipated when the underwriters paid for her as a constructive total loss.

Wrecking operations on the stranded barge Winona at Houghton are still going on, an attempt is being made to dig a channel 60 feet wide and 15 feet deep to the boat through the sand beach. Heavy weather will fill up the channel as soon as dug, but if the wreckers are favored with good luck they will release her.

The Canadian steamer Myles, Duluth to Kingston with corn has a badly damaged cargo at Prescott. Fully 50,000 bushels are wet and the grain is caked so hard that an elevator leg could not work in it. The elevator company has refused the cargo. The damage is probably the result of heavy weather encountered during the trip down.

The federal government is very active in pushing the work of surveying the lakes at the head of the Mississippi and along the Fosston line. A surveying party is now in the field, and another is organizing to work in the northern country. The object of the surveys is to furnish the government with information regarding the most desirable points for the location of reservoirs.

A break in the Hennepin canal, in Bureau county, Ill., has been caused by shifting quicksands. The steam shovels excavating the canal cut through a bed of hardpan overlying the quicksand, and the surface water all drained through into the sand, and caused it to slide and settle, so that the bottom of the cut is now 10 ft. below the established grade. Reports state that no firm bottom can be found at a depth of 40 ft.

Now some people are talking of war against the new Great Lakes Towing Co. by the Dunham Towing Co., of Chicago, the two Buffalo lines, the Delta Wrecking Co. at Escanaba, and one of the Toledo companies. It is safe to say that there will be no war. Such a course would be suicidal, as the stockholders of the new company, all vessel owners, who will see to it that all of their towing is done by tugs belonging to the corporation. Besides, it costs a great deal of money to inaugurate and prosecute a war, even under the most favorable circumstances.—Milwaukee Evening Wisconsin.

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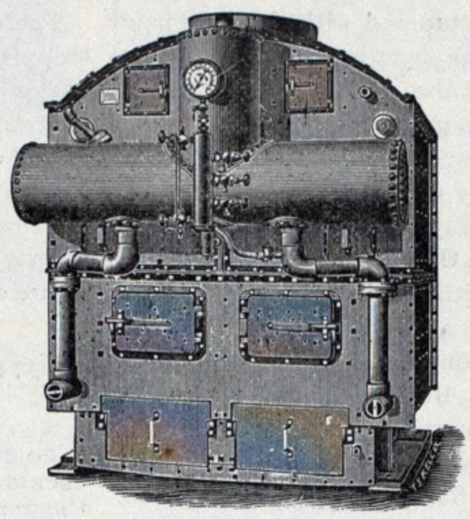

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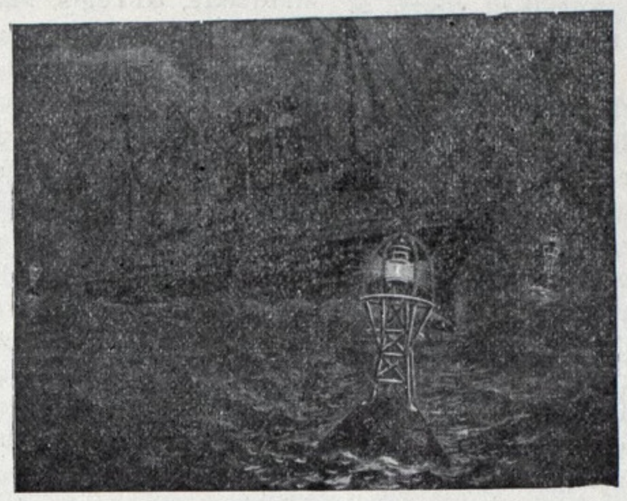

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WHAT CONSTITUTES AN EFFECTIVE BLOCKADE.

In case of the steamship Olinde Rodrigues the Supreme Court of the United States passed upon the very interesting question, What constitutes an effective blockade? The vessel in question was captured by the United States armed cruiser New Orleans while attempting to enter the blockaded port of San Juan, Porto Rico, on the morning of July 17, 1898. The claimants for the discharge and restitution of the steamship contended that the blockade of San Juan at the time of the capture of the Olinde Rodrigues was not an effective, blockade, and that the vessel was not violating the blockade when seized. The District Court rendered an opinion Dec. 13, 1898, holding that the blockade of San Juan was not effective, and entered a decree ordering the restitution of the ship to the claimants. From this decree the United States appealed to the Supreme Court, and the latter tribunal found itself unable to concur with the learned district judge in the conclusion that the blockade was not effective, holding that a vessel actually captured in attempting to enter a blockaded port, after warning entered on her log by a cruiser off that port only a few days before, cannot dispute the efficiency of the force to which she was subjected; in other words, that an effective blockade is one that is so effective as to make it dangerous in fact for vessels to attempt to enter the blockaded port. Following out this view of the case, it was held that the effectiveness of a blockade is not to be determined by the number of blockading force, for if a single modern cruiser blockading a port renders it in fact dangerous for other craft to enter the port the blockade is practically effective—all of which appears to be common sense as well as good law. Chief Justice Fuller, who wrote the opinion, well remarked that in this case the vessel had been actually warned twelve days before her seizure, and that no reason existed for the supposition that the blockade had been pretermitted or relaxed; under these circumstances her commander had no right to experiment as to the practical effectiveness of the blockade, and if he did so he took the risk.

CAUSES OF EARTHQUAKES.

The cause of earthquakes was the subject chosen by M. Stanislas Meunier for a recent lecture at the Paris Museum of Natural History. Starting from the received hypothesis that the earth is cooling, though slowly and without condensation, that it is formed by a liquid nucleus, surrounded by a solid crust, and that contraction due to cooling causes cracking, fissures, and large faults, the lecturer pointed out that these clefts and faults receive hydrated rocks which, through the action of gravity or successive glidings approach the roof of the underground excavations, and at last fall to the bottom of these abysses, formed of hot and anhydrous rocks. On coming into contact with the burning mass at the bottom the local temperature of which is still further raised by the impact, the water of hydration contained in the blocks is instantaneously converted into steam, producing dynamic effects of great intensity.

The enormous mass of steam thus formed at a very high temperature causes the weaker portion of the earth's crust to fall in, opening the craters of extinct volcanoes or giving them fresh activity, and drawing along the lateral or subjacent matters. If the submarine bottom be thus raised, one of those terrible tide rushes is produced, which penetrate so far and so violently inland, devastating and carrying away with them all that they encountered in their sudden return. The shock may be more or less intense and extend to a greater or less distance, according to the depth or fall and the amount of vaporization, but, wherever these effects are felt, the surface undergoes changes of condition or position which are registered by the seismograph and other ingenious instruments. An illustration of the lateral displacement of the surface was given by M. Meunier, who showed, projected on a screen, photographs of a railway train overturned laterally, and of a line of rails which had assumed a sinuous curve, in consequence of an earthquake shock.

BIDS FOR GOVERNMENT WORK.

Bids were opened at Duluth, Minn., on July 22, for removal of revetment work in the upper canal, Portage Lake Ship Canals, Mich., by Major C. B. Sears, Corps of Engineers, U. S. A. Messrs. Powell & Mitchell, Marquette, Mich., were the highest bidders, at $16,580, and John McCallum, Hancock, Mich., the lowest, at $7,815. Other bids varied as follows: Porter Bros., Duluth, $10,987; Alex. Sang, Duluth, $11,631; Frank Campbell, Duluth, $8,890; Hugo & Tims, Duluth, $9,402 and Edward J. Hingston, Buffalo, $12,823. The McCallum bid being the lowest Major Sears recommended its acceptance.

For repairs to the breakwater at Ashland, Wis., Major Sears opened the bids on July 28, and found that Peter P. Ferguson, Ashland, Wis., was the lowest bidder, $10,896 for the entire work. Messrs Belknap Bros., Ashland, Wis., being the highest at $14,820. The other bids were H. Asselstine, Ashland, $11,640 and Hugo & Tims, Duluth, $11,073. The contract will probably be awarded to Peter P. Ferguson as the lowest responsible bidder.

LAKE STORMS IN AUGUST.

BY ALFRED J. HENRY, CHIEF OF DIVISION.

The perils of navigation in summer due to causes connected with the weather are mainly those of fog and squall winds. The latter almost invariably occur in connection with thunderstorms. Thunderstorms develop on warm, sultry days, generally with a falling barometer. The approach of a thunderstorm can generally be foretold by the barometer and the appearance of the sky. The violence of the squall winds also can in a measure be foretold by noting the color of the storm cloud and its elevation above the lake surface. Dark green or olive colored clouds indicate severe squall winds, especially when near the surface of the water or ground.

BYE GONE CANALS.

The recent report of the sale of the Delaware & Hudson canal, running from Rondout, N. Y., to Honesdale, Pa., added one more to the long list of State canals which have given way to the advance of railroads. The general disappearance of canals, notably during the past twenty years, is due largely to the decision of the Inter-State Commerce Commission in June, 1887, recognizing competition of water rates as justification for the suspension of short hauls and also to the enormous increase in river navigation.

In speaking of the gradual disappearance of canals, former Governor Hoadley said: "Canals are a back number. There are local exceptions, as, for instance, in some of the coal districts, where it is entirely practicable to transport coal by canals. But without exception as to passengers, and with very few exceptions as to freight, the canals are gradually being driven out of existence by the railroads. In Ohio the White River canal, which ran into Cincinnati, and the Lebanon canal are discontinued. The Miami still continues, but it runs parallel to half a dozen lines, and it is of no account."

WRECK AND CASUALTY REPORT FROM JUNE 16 TO JULY 15.

BY NORMAN B. CONGER, LOCAL FORECAST OFFICIAL AND MARINE AGENT.

June 29: Steamer Margaret Olwill, loaded with limestone, Kelley's Island for Cleveland, was caught in heavy northeaster, and in attempting to come about and run with the gale, the wheel chains parted and the vessel foundered eight miles off Lorain, carrying down eight of the twelve persons on board. Total loss; estimated value of vessel, $11,000; cargo, $1,500; total, $12,500. The four survivors were rescued by the steamers State of Ohio and Sacramento.

July 4: Steamer Majestic stranded in Bailey's Harbor, Lake Michigan, during very dense fog; estimated damages, $3,000.

July 5: Steamer Geo. T. Hope stranded at North Point, Milwaukee, during dense fog; damages nominal.

July 8: Steamer Sequin (Canadian) was driven ashore near Ashtabula during heavy southwest gale. Amount of damages not reported.

Schooners Warmington and Sophia Minch, in tow of steamer John C. Glidden, broke loose from towing steamer, in heavy southwest gale and went ashore five miles west of Ashtabula.

July 11: Steamer Osceola stranded at Detour during dense fog, and released without damage.

Steamer E. W. Oglebay stranded between Round and Bois Blanc Islands during heavy fog. Floated after jettisoning a portion of the cargo. Hull damaged by rocks.

July 13: Steamer Lizzie Madden stranded at Sand Island, Apostle Group, during dense fog; released with nominal damages.

The reports of amount of damages in the above cases have not yet been accurately ascertained, and will be reported in a later issue.

VISIBLE SUPPLY OF GRAIN

As compiled for THE MARINE RECORD, by George F. Stone Secretary Chicago Board of Trade.

CITIES WHERE STORED.	WHEAT. Bushels.	CORN. Bushels.	OATS. Bushels.	RYE. Bushels.	BARLEY Bushels.
Buffalo	1,520,000	909,000	185,000	29,000	114,000
Chicago	5,720,000	3,101,000	1,092,000	277,000	57,000
Detroit	273,000	29,000	9,000	8,000	.....
Duluth	4,325,000	324,000	89,000	22,000	76,000
Fort William, Ont.	1,720,000	.....	.....	.....	.....
Milwaukee	58,000	3,000	.....	.....	10,000
Port Arthur, Ont.	150,000	.....	.....	.....	.....
Toledo	1,435,000	723,000	32,000	2,000	.....
Toronto	68,000	....	10,000	....	13,000
On Canal	506,000	.....	546,000	.....	90,000
On Lakes	429,000	985,000	162,000	26,000	80,000
Grand Total	36,019,000	11,646,000	3,794,000	587,000	532,000
Corresponding Date, 1898	9,093,000	17,575,000	3,440,000	305,000	343,000
Increase	6,000	.....	.....	.....	.....
Decrease	.....	1,681,000	905,000	24,000	297,000

While the stock of grain at lake ports only is here given, the total shows the figures for the entire country except the Pacific Slope.

SALARIES OF LOCAL INSPECTORS OF STEAMBOATS.

Under the provisions of section 4414 of the Revised Statutes of the United States, as amended by the act of Congress approved March 1, 1895, it is provided that the salaries of the local inspectors of steam vessels shall be regulated in proportion to the number of steamers inspected in each of the various districts, as follows:

In districts inspecting 100 steamers and less, to a salary of $1,200 per year each.

In districts inspecting over 100 and less than 150 steamers, to a salary of $1,500 per year each.

In districts inspecting 150 and less than 200 steamers, to a salary of $1,800 per year each

In districts inspecting 200 and less than 300 steamers, to a salary of $2,000 per year each.

In districts inspecting 300 and less than 500 steamers, to a salary of $2,250 per year each.

In districts inspecting 500 steamers and upward, to a salary of $2,500 per year each.

The act further provides that the basis of salaries from the date of approval of the act March 1, 1895, shall be on the report of inspections for the preceding year, and thereafter according to the number of steamers reported inspected at the end of each fiscal year, which shall regulate the salaries for the following year, for each local board, as reported by the Supervising Inspector-General.

Therefore, in accordance with the report of that officer for the fiscal year ended June 30, 1899, the salaries of local inspectors of hulls and local inspectors of boilers from July 1, 1899, to June 30, 1900, inclusive, are hereby established, as follows:

For the districts of Evansville, Ind.; Louisville, Ky.; Memphis, Tenn.; Nashville, Tenn.; Cincinnati, Ohio; Gallipolis, Ohio; Wheeling, W. Va.; Burlington, Vt.; Bangor, Me.; Galveston, Tex., and Apalachicola, Fla., at the rate of $1,200 per year for each local inspector.

For the districts of New Haven, Conn.; Savannah, Ga.; Charleston, S. C.; Dubuque, Iowa; Superior (Marquette, Mich.); Mobile, Ala., and Jacksonville, Fla., at the rate of $1,500 per year for each local inspector.

For the districts of Portland, Oreg.; St. Louis, Mo.; Oswego, N. Y.; New London, Conn.; Portland, Me.; Detroit, Mich.; Pittsburgh, Pa.; Alaska (Juneau); Port Huron, Mich., and Providence, R. I., at the rate of $1,800 per year for each local inspector.

For the districts of Puget Sound (Seattle, Wash.); Albany, N. Y.; Grand Haven, Mich.; Milwaukee, Wis.; Chicago, Ill.; Duluth, Minn., and Norfolk, Va., at the rate of $2,000 per year for each local inspector.

For the districts of Philadelphia, Pa.; Boston, Mass.; Baltimore, Md.; Buffalo, N. Y.; New Orleans, La.; Cleveland, Ohio, and San Francisco, Cal., at the rate of $2,250 per year for each local inspector.

For the district of New York, N. Y., at the rate of 2,500 per year for each local inspector.

SEA TERMS USED ASHORE.

The use of sea terms, as applying to matters ashore, is so common nowadays that one seldom stops to think of their origin. The forecastle of the deep sea ship is by no means a college of learning, but from Jack's vocabulary many terms particularly applicable have been borrowed. Take the word "mainstay." "He is the mainstay of the family," is heard every day. The mainstay is the most important part of the rigging of the mainmast, hence a term. A couple are said to be "spliced" when they are married. When the landsman considers that in splicing, the strands of the rope are intertwined, as the two lives should be, so strongly that a union is formed which will withstand more strain than any other part of the rope, it signifies marriage as it should be according to Jack's ideas. It is common to say a man is on his "beam ends" when he is in financial distress. As with a ship his position is one of danger, with probable disaster ahead. The term "hard up" indicates a position of difficulty financially. When a ship is in a position of difficulty or danger her helm is put "hard up," in an effort to avert the danger ahead. "Taken aback" is a familiar expression. When a ship is taken aback her sails are flattened against her masts, stopping her headway and paralyzing her, so to speak; two other nautical expressions often used ashore are "turn in" for going to bed and "turn out" for rising. To say a man intoxicated is "half-slewed" means that he is half turned around and travels an erratic course. A man without "staying power" is another term. When a ship will not "stay" she will not come around into the wind so as to be put on the other tack, hence she will not make headway. To say a man is "on another tack now" means he has changed his course of action from one method to another, the same as a ship changes her course when she tacks. "I'll get to windward of him yet" is a common expression, when one desires to indicate that he will get a position of advantage over another. It is also said a man is "sailing close to the wind" when it is meant he is acting with great caution. Then you hear it said, "There was a hitch in the arrangements." "I'll run afoul of him some day" is another natural expression in daily use. A man is "cranky" when he is mentally unbalanced. A ship is "cranky" when she leans or lists perilously to one side or the other under the pressure of light winds or moderate seas. There are hundreds of these sea terms used every day ashore as, for instance, "making headway," "a shot in the locker," "sailing under false colors," "how does the land lie?" "Is the coast clear?" "rigged out," "cruising about," and many others.

Fault in Management of Vessel.—After a vessel had been out of port only four or five days, and had encountered no severe weather or known accident, both covers of one of her ports were found to be open, and water had entered and damaged cargo in the compartment into which the port opened. Neither the covers nor the surroundings of the port were injured, and the hatches had been battened down since the beginning of the voyage. Held, that neither evidence that the vessel was inspected the day before sailing, and the port believed to be closed, nor even the positive testimony of witnesses that the covers were closed and screwed fast when the vessel sailed, was sufficient to establish such fact, but that, under the rule laid down in The Sylvia, 19 Sup. Ct. 7, 171 U. S. 462, the condition of the port did not render the vessel seaworthy, and the failure to close it before the injury was received by the cargo was a fault or error in the management of the vessel during the voyage, for which the owners are relieved from liability under section 3 of the Harter act. Farr & Bailey Mfg. Co. vs. International Nav. Co., 94 Fed. Rep. (U. S.) 675.

HYDROGRAPHIC OFFICE NOTES.

Lake Superior—Minnesota—Two Harbors—Information Concerning Breakwaters—Depth Alongside Docks.—The following information concerning the government breakwaters at Two Harbors was obtained from Mr. J. H. Darling, U. S. Assistant Engineer:

The breakwater at the west side of the harbor is built to the length of 750 feet, 150 feet to be added and finished in the year 1900.

The breakwater at the east side of the harbor is built to the length of 750 feet; the proposed extension of 250 feet in the same direction has been abandoned and in its stead an extension at an angle of 45° southward 300 feet in length is proposed, making the entire length of this (Eastern) breakwater 1,050 feet. This is also to be finished in the year 1900.

Information has been received from Mr. R. Angst, chief engineer of the Duluth and Iron Range Railway, that the least water on both sides of all the ore docks in Agate bay, Two Harbors, is 20 feet, 18 feet on both sides of the merchandise dock, and the same depth on the southwest side of the coal dock.

Lake Superior—Marquette Bay—Presque Isle Point—Particulars of Breakwater—Ore Docks.—Information has been received from Major C. B. Sears, Corps of Engineers, U. S. Army, that the breakwater off Presque Isle Point, Marquette Bay, Michigan, in course of construction for the protection of the ore docks in that locality, is at present 500 feet long and is to be extended 500 feet in the same direction lakeward, the work to be finished in the year 1900.

Information has been received from Mr. J. F. Deimling, chief engineer of the Lake Superior and Ishpeming Railway, that the depth of water on both sides of their ore dock at Presque Isle is 20 feet, and 18 feet at the merchandise dock.

Contract for Repair of Vessel—Extra Work—Waiver of Written Contract.—A provision of a written contract for the repair of a vessel, that no extra work should be done unless an estimate in wrtting was first made and submitted to and signed by an officer of the company owning the vessel, may be waived; and where, after the vessel was stripped to begin the work, it was found to be imposible to make the repairs specified in the contract without to a large extent rebuilding the hull, and after consultation with the officers of the company the contractor was told by the president to go on with the work, which he did, and under the direction of a superintendent employed by the company, and with the knowledge of its officers and directors, replaced all the rotten parts of the hull, and made the vessel sound and seaworthy, the company, having accepted the vessel, must be considered as having waived the written contract, and cannot invoke its provisions to defeat recovery for all work done not specified therein. The Sappho, 94 Fed. Rep. (U. S.) 545.

There is no part of the world which has such a record for wrecks as the narrow Baltic Sea. The number in some years has averaged more than one a day, although it should be stated that the majority were small craft, fishing boats, etc. The greatest number of wrecks recorded in one year was 425, and the smallest 154. About fifty per cent. of these vessels became total wrecks, all the crews being lost.

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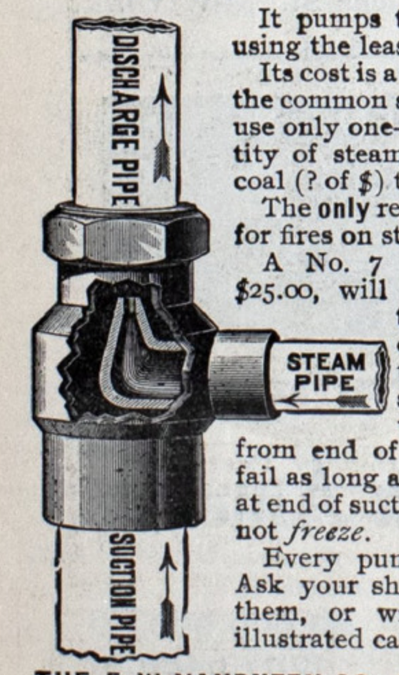

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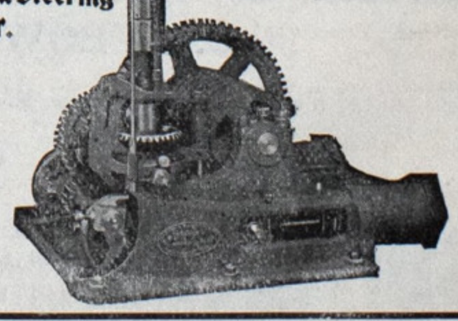

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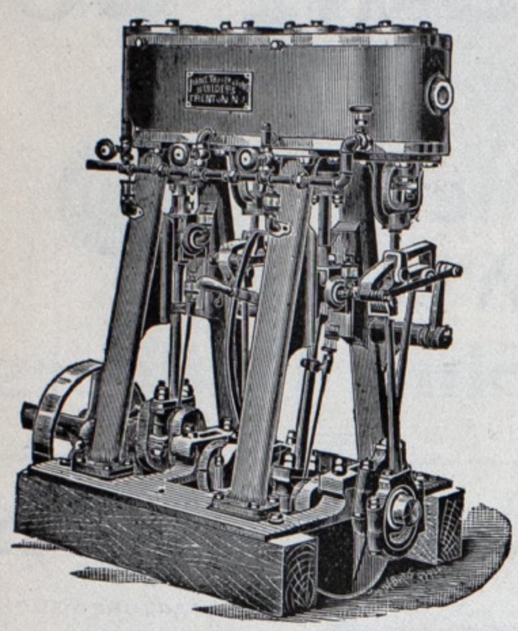

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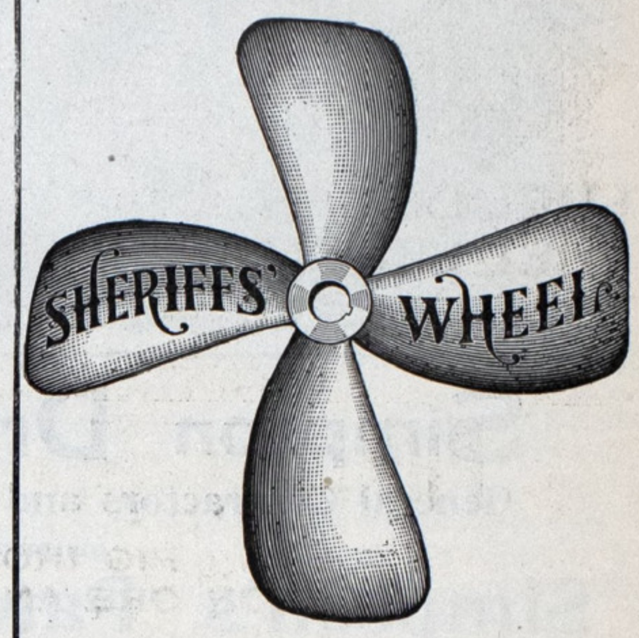

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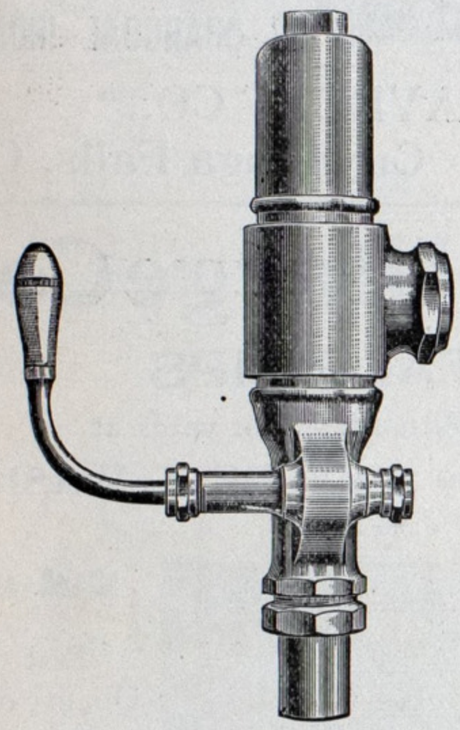

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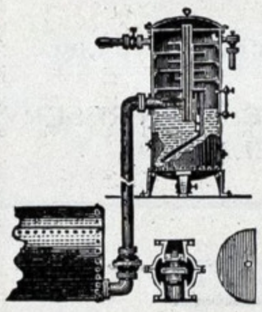

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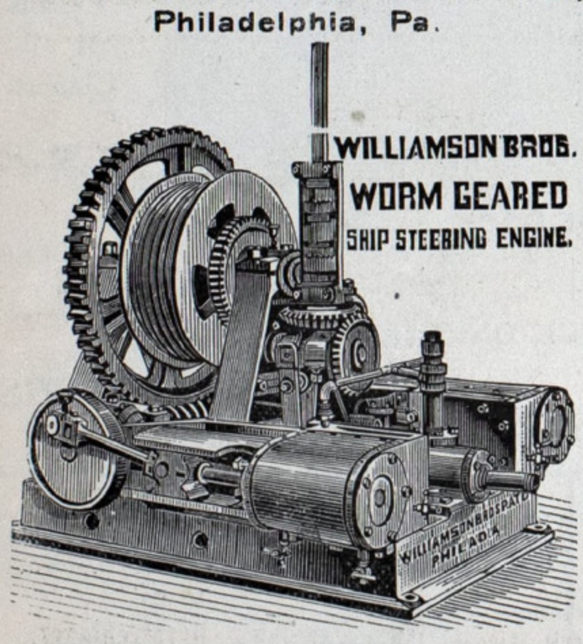

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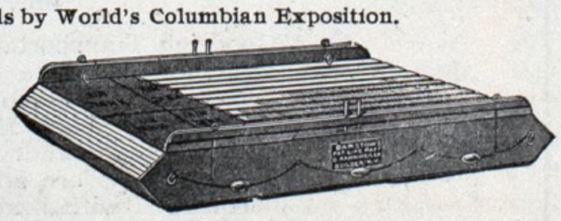

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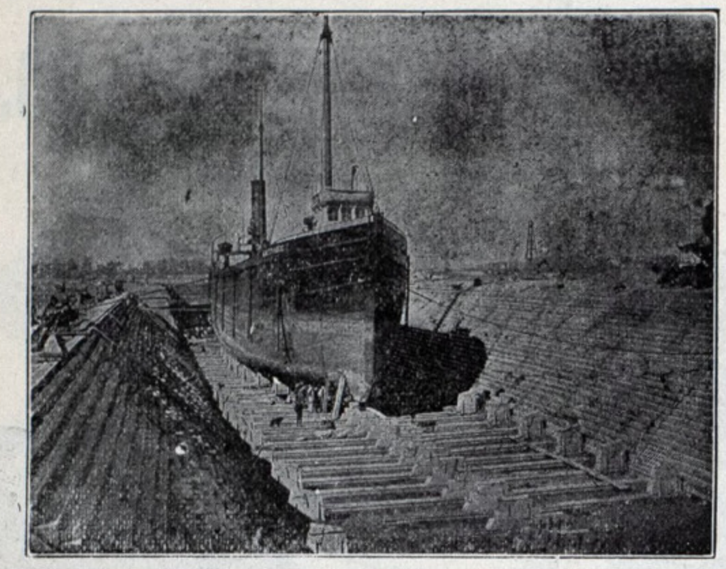

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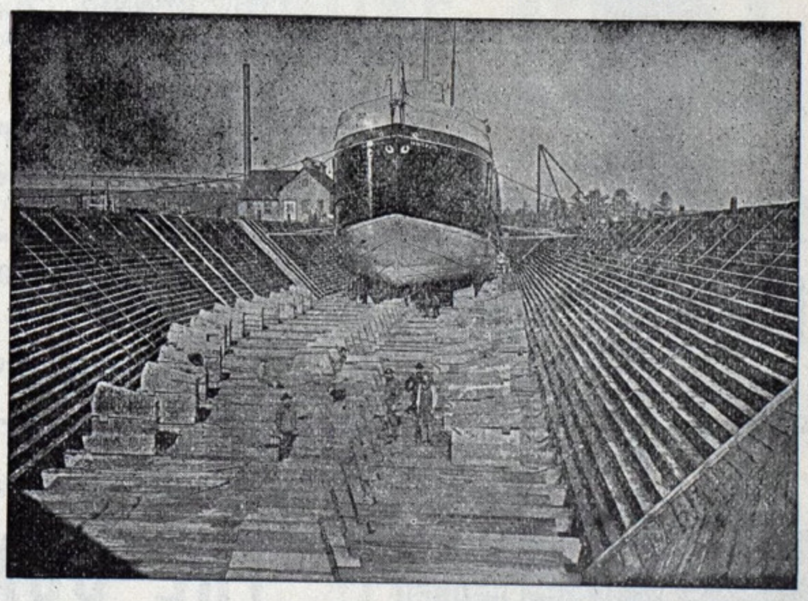

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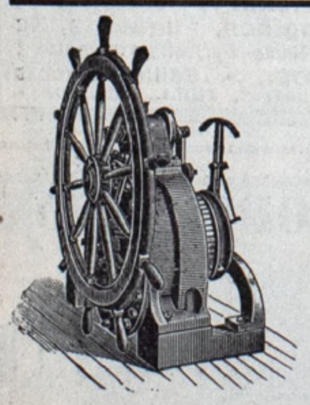

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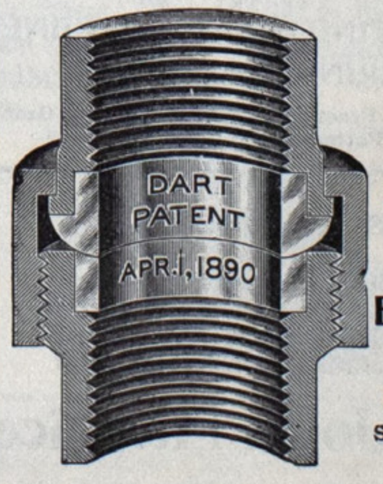

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